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EXPERIMENTS IN LEARNING.

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The experiments described in this article form a part of a course in experimental education which has now been in operation for several years in connection with the classes in educational psychology at the University of Wisconsin. The writer has attempted to develop a course of experiments for students of education of the sort so well prepared for the general student of psychology in the manuals of Judd and Seashore. Some of the experiments in learning are presented here in the hope that they may be suggestive of the kind of experiments which may be developed where there is little or no opportunity for laboratory work. Even with a fairly well equipped psychological laboratory at one's disposal, it is not always feasible to conduct a course of laboratory exercises of the usual sort. The time allotted to the subject in the curriculum may not be sufficient to allow for the acquirement of the technique required in handling more or less elaborate apparatus, and even where there is time, it is often questionable whether in the introductory course the results are commensurate with the efforts demanded. On the other hand, few teachers will deny the advantages of some sort of experimenting on the part of the elementary student, and where there are no laboratory facilities experiments of the general kind here described will, it is the writer's opinion, justify themselves. Where laboratory facilities are at hand the equipment is seldom sufficient to admit of individual experimentation on the part of the large classes usually found in the introductory courses. If apparatus is employed,

it must be of simple design and arrangement, so that it may be easily duplicated, and also that the student may work without much direct supervision.

The above statement is not presented as an apology for the simplicity of the experiments outlined below, but as an indication of the conditions which are usually met with by those who desire to give some opportunity for experimental work in the introductory course, and which make desirable some such experiments as are here described.

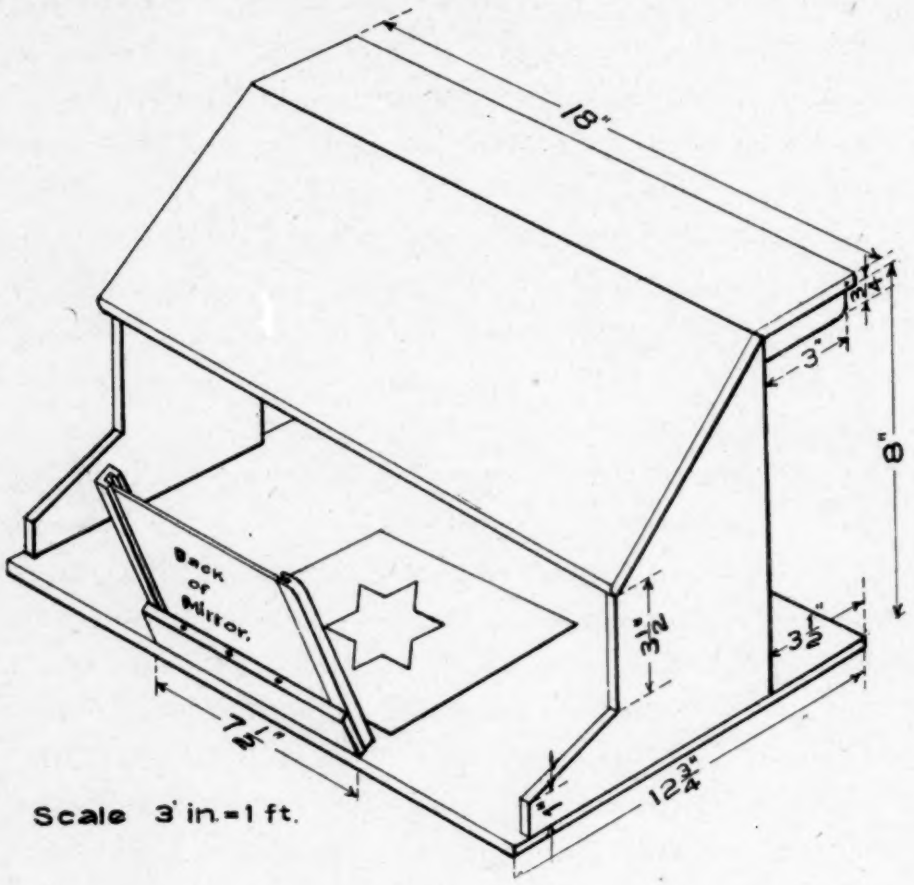


Figure 1.

1. *The Trial and Error Method of Learning.*[1]

In connection with the close discussion of the various meth-

[1] This experiment was first made use of by the writer in 1905, and had, as far as the writer was aware, not been described. It has since been employed by *Judd*, Manual of Laboratory experiments, and *Burt*, British Journal of Psychology, December, 1909, and possibly elsewhere.

For an interesting practice experiment with this apparatus see an article by *Starch* in the Psychological Bulletin, 1910.

ods of learning, such as the so-called "trial and error," imitation and reasoning, some experimental work is of distinct advantage. Actual demonstration of the results, if not of the processes of animal learning, such as might be done with the white rats and maze, might be more convincing than the direct experiment of the student, but this is seldom possible.

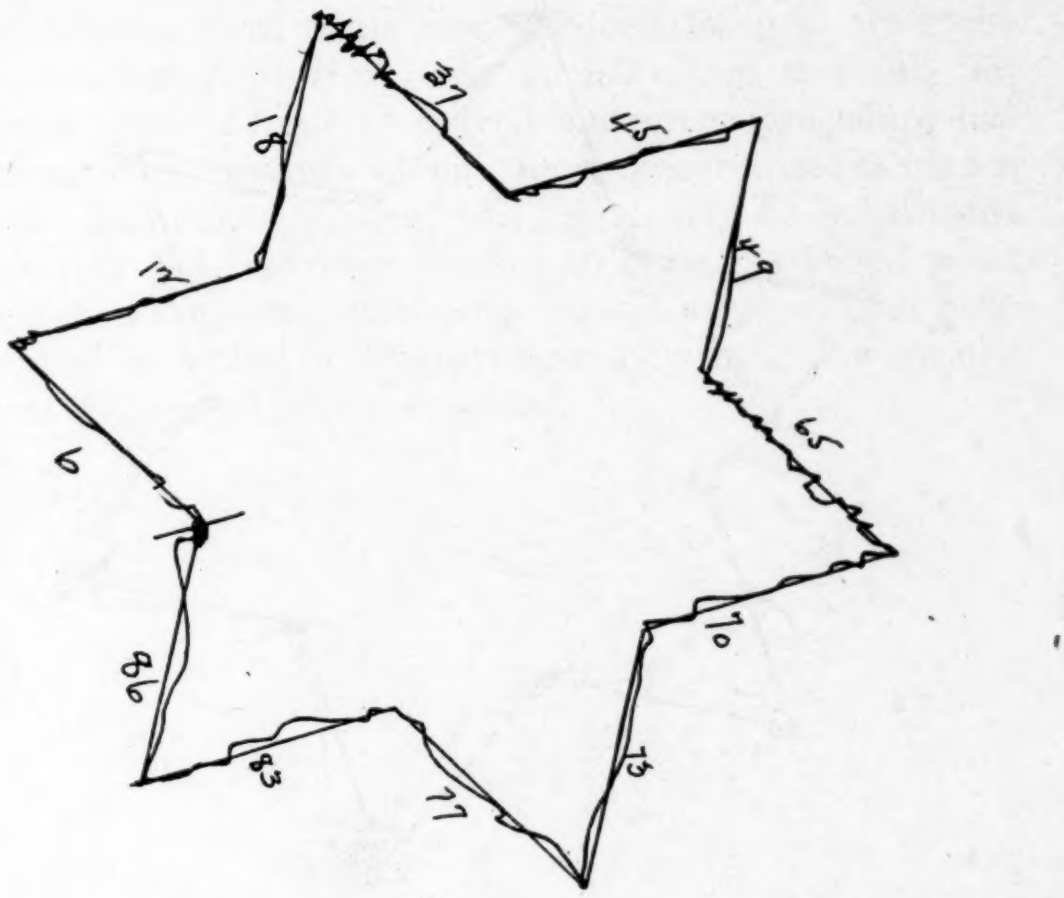


Figure 2.

There is, on the other hand, some advantage in an experiment which will indicate that the trial and error method is in certain conditions regularly employed, even in adult human learning. The student is apt to get the impression from the usual discussion that trial and error, as a method of learning, is confined in its use to animals and children.

In the experiment suggested the subject is directed to trace out the figure of a star by means of its image as seen in a mirror. The figure itself and the hand and arm employed are concealed from direct view by means of a simple screen as shown in Fig. 1, and all visual guidance is secured solely from the reflection in the upright mirror. In such a test

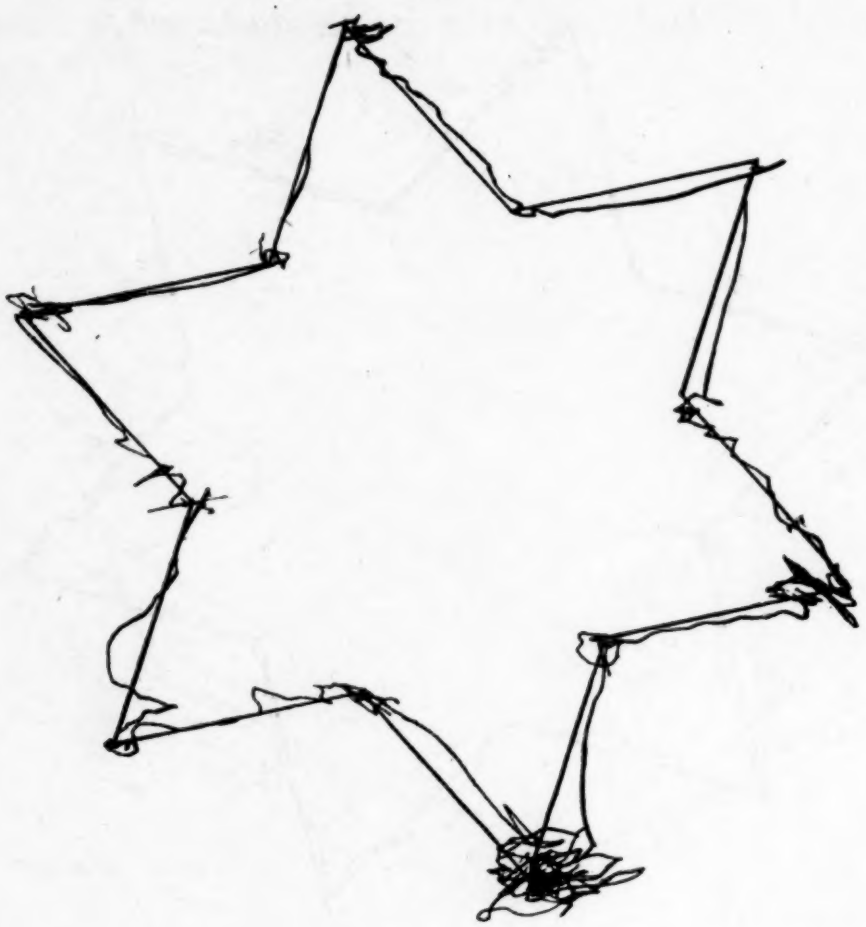


Figure 3.

as this, there is disturbance of the usual relation of visual and motor factors, which has to be adjusted. To one familiar with the principles of the mirror,—and theoretically we all are—the problem is one which might very well be reasoned out. It should, perhaps, present no greater difficulties than some of the tests for reasoning applied to animals, and is at any rate as much within our field of experience as some

of the latter tests are within the animal's range. The natural reaction is, however, not to reason much about it, but to make actual trial of it from the start. Typical results of such a trial are indicated in Figs. 2 and 3. The subject is directed to keep to the line, and, if he gets off, to return to it as quickly as possible. The star is printed at such an angle that no lines are exactly parallel or perpendicular to the base line of the mirror. The chief difficulty is experienced on the slanting lines. After several trials most subjects learn to trace the figure with but few errors. As an indication that this improvement on the basis of a trial and error procedure has not necessarily resulted in any more general acquaintance with the real difficulty involved, Fig. 4 may be substituted for the star and the subject asked to place his pencil point at the dot in the center of the figure, and draw without hesitation and with but a single rapid movement toward the numeral designated by the operator.

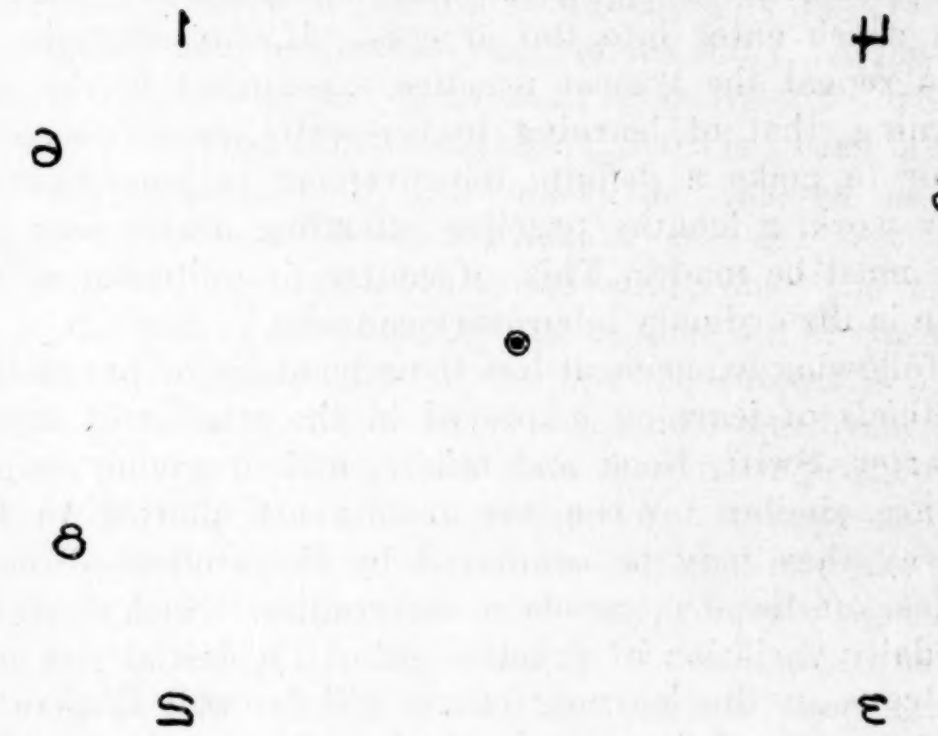


Figure 4.

As a further modification, the first trial of the test may be made with the left hand. Let one-half of a star be traced with the left hand and then after practicing with the right hand until considerable improvement in time and accuracy has been noted the remaining half of the first star may be traced by the left hand, and the improvement over the first trial noted. This furnishes a test of the "transference from right to left hand." Some indication of how much of this is due to the mere repetition of the second trial and how much to other factors may be secured by having one-half of the class make only the left hand tests without the practice with the right, and using this result as a check upon the data of the other half of the class.

II. *The Practice Experiment.*

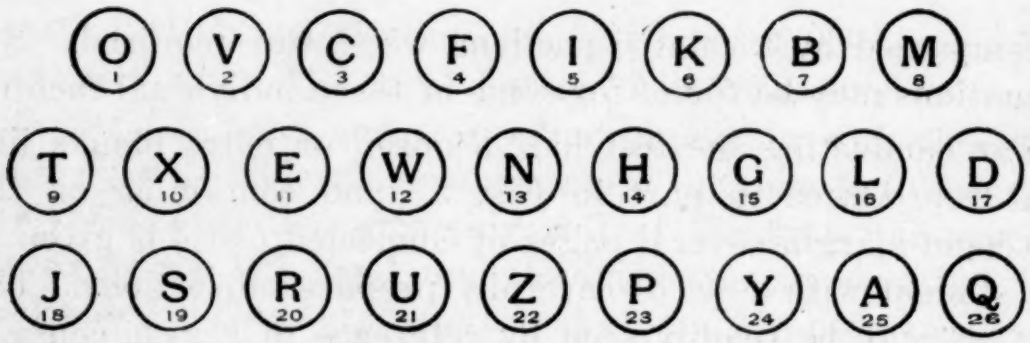
The chief difficulty in adapting experiments in learning to an experimental course is that it takes time to learn anything worth while and still furnish opportunity to follow carefully the rate of progress and to analyze the various factors which enter into the process. If, for example, we were to repeat the typical practice experiment in the rate of learning, that of learning to typewrite, to write shorthand, or to make a definite improvement in some sort of memory work, a lengthy practice extending over weeks and months must be made. This, of course, is quite out of the question in the ordinary laboratory course..

The following experiment has the advantage of paralleling the methods of learning employed in the studies of Bryan and Harter, Swift, Book and others, and of giving results which are similar. When the results are plotted in the usual way they may be compared by the student directly with those of these more elaborate studies. Such features as the daily variation of practice gains, the initial rise and the plateaus in the learning curve will be well illustrated by at least some of the records obtained by the class. Individual differences, of course, appear here as elsewhere, when

accompanied by the introspections which are required. Explanations may be found for some of these individual factors.

For conducting the test half a dozen or more blanks like that reproduced in part in Fig. 5 [2] and containing on the left hand margin several pages of connected prose is given to the student with a set of carefully prepared directions. The test, as may be readily seen by reference to Fig. 5, consists in spelling out the words on the left hand margin by substituting for each letter the numbers found associated with the particular letters in the circles of the keyboard at the top of the blank. The numbers are placed in the little square to the right of each line, one number being substituted for each letter that appears on the corresponding line. The students are directed to practice a definite time,—five or ten minutes each day, at a given hour, in making these substitutions. The purpose of the test being to make as many substitutions as possible in the allotted time *without error,* it being distinctly desirable to have but one measure of progress, namely, the time taken uncomplicated by an error curve. The results of the practice are plotted daily, as the knowledge of the results serves as some incentive to effort. As a further incentive to maximum effort, there is a certain amount of rivalry which usually develops in the class as the experiment progresses. The initial and at least one test towards the end of the practice may advantageously be made in class; the rest of the practice may be done out of class hours. On each day before making the test the subject is asked to record whether or not he expects to make improvement over the previous record. This furnishes some indication of the mental attitude in which the experiment is approached. In addition, he is asked to record his physical and mental condition, or any other factors which may influence the performance of the test. If, for example, there appears a period of little or no progress lasting for several days, he has an

[2] This blank is a modification of on which the writer found in use in the Psychological Laboratory of the University of Wisconsin.



sentences of Latin or Greek.
he cannot get through a simple
sum of arithmetic, without
making a slip at some stage of
the process, because he loses
his attention. Year after
year he goes on indulging this
slovenly habit of mind; the
remonstrances of teachers
are of no avail; he will not
take the pains to be cured; the
inaccurate desultory
knowledge of many things is
more acceptable to his mind
than the accurate knowledge
of a few, and so he grows up and
goes into life unfit for any
intellectual calling, unfit
for any business or profes-
sion. Then again there is
another kind of inaccuracy
which consists in ignorance
of the first principles or
beginnings of things; when
the student has to go back not
without difficulty, for
there is always a painfulness
and awkwardness in learning
late what ought to have been
learned first. We all know
what is meant by a man being "a
bad scholar," which to one
who has studied Latin and
Greek for ten or more years of
his life is justly held to be a
reproach. And there are bad
scholars, not only among
students of Latin and Greek,
but in every department of
knowledge, in Mathematics

Figure 5.

opportunity of testing the validity of Swift's suggestion that the *ennui* resulting from the monotony of practice is a causative factor. He is also asked to record the time at which he finds he has through actual use learned the equivalents of all the letters,—it being definitely understood that the substitutions are not to be memorized independently, but only learned by employing them.

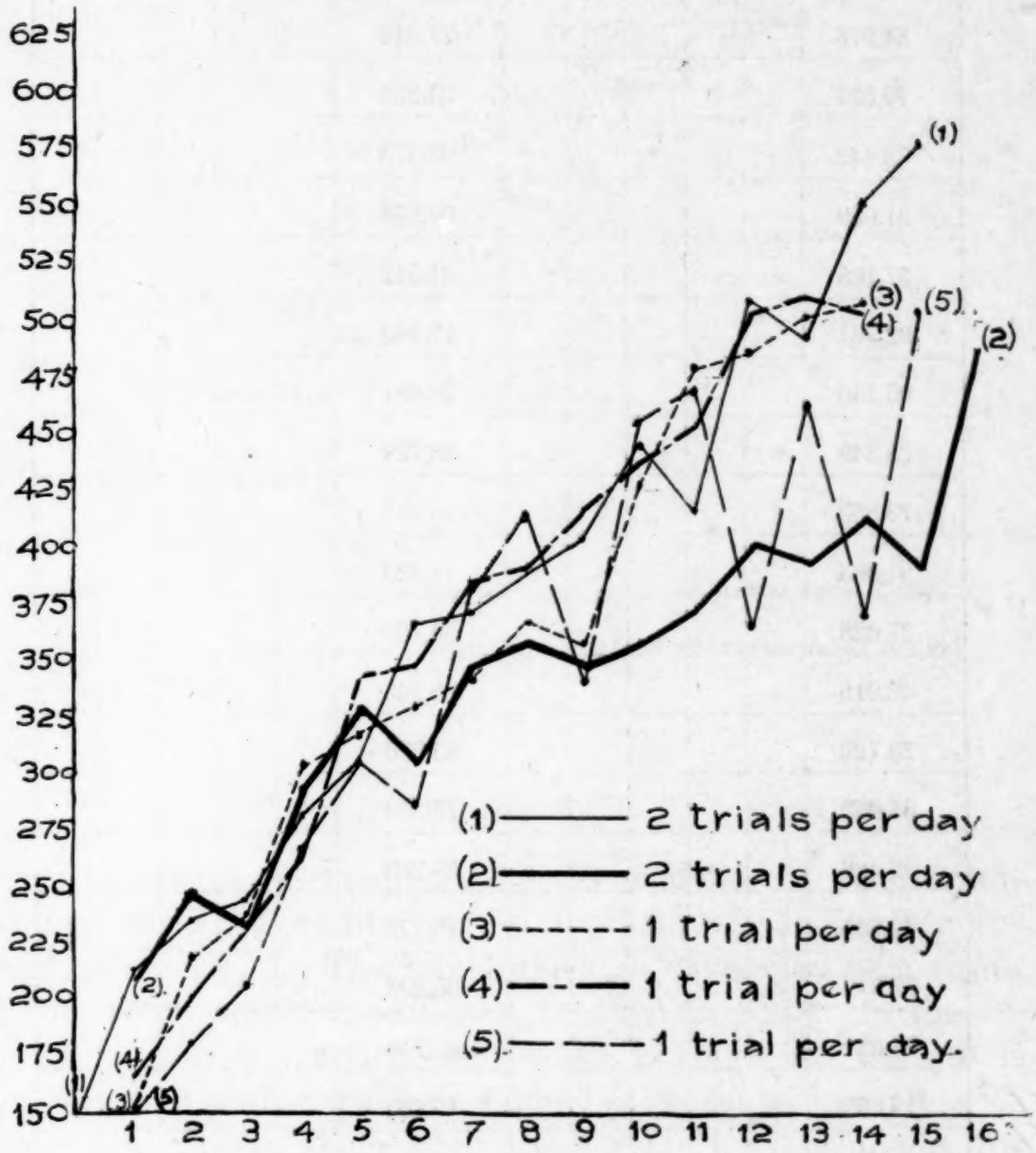
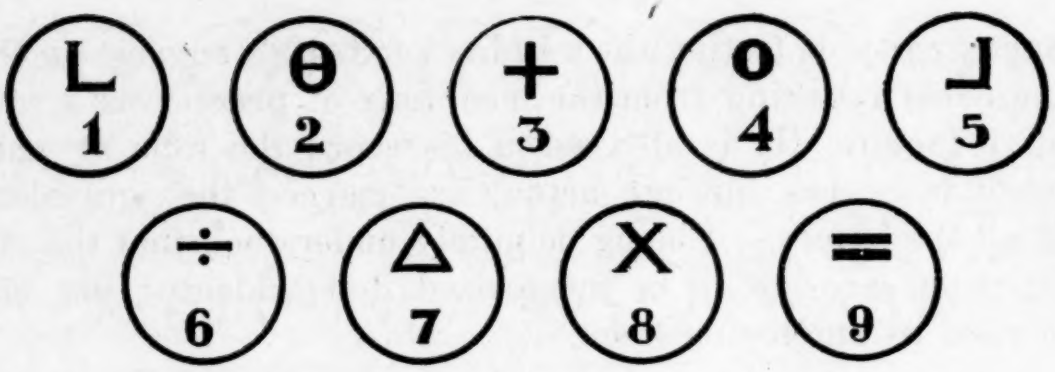


Figure 6.



84,976						27,516						
79,821						33,821						
63,442						97,473						
21,629						62,978						
57,183						31,542						
32,761						17,143						
95,146						26,981						
28,349						35,724						
73,862						16,315						
91,563						14,923						
37,628						34,762						
42,916						28,543						
23,729						83,936						
85,652						75,314						
35,486						56,283						
29,635						19,175						
72,518						36,293						
24,631						85,746						
19,852						15,283						
76,431						24,976						

Figure 7.

In Fig. 6 there are reproduced several curves as plotted by individual students.

Before beginning practice an illustrative experiment of the general effects of special practice may be introduced by testing in somewhat closely or more distinctly related activities, as the rate of tapping, of crossing out A's from a printed page, or of such a test as is shown in Fig. 7. The latter test

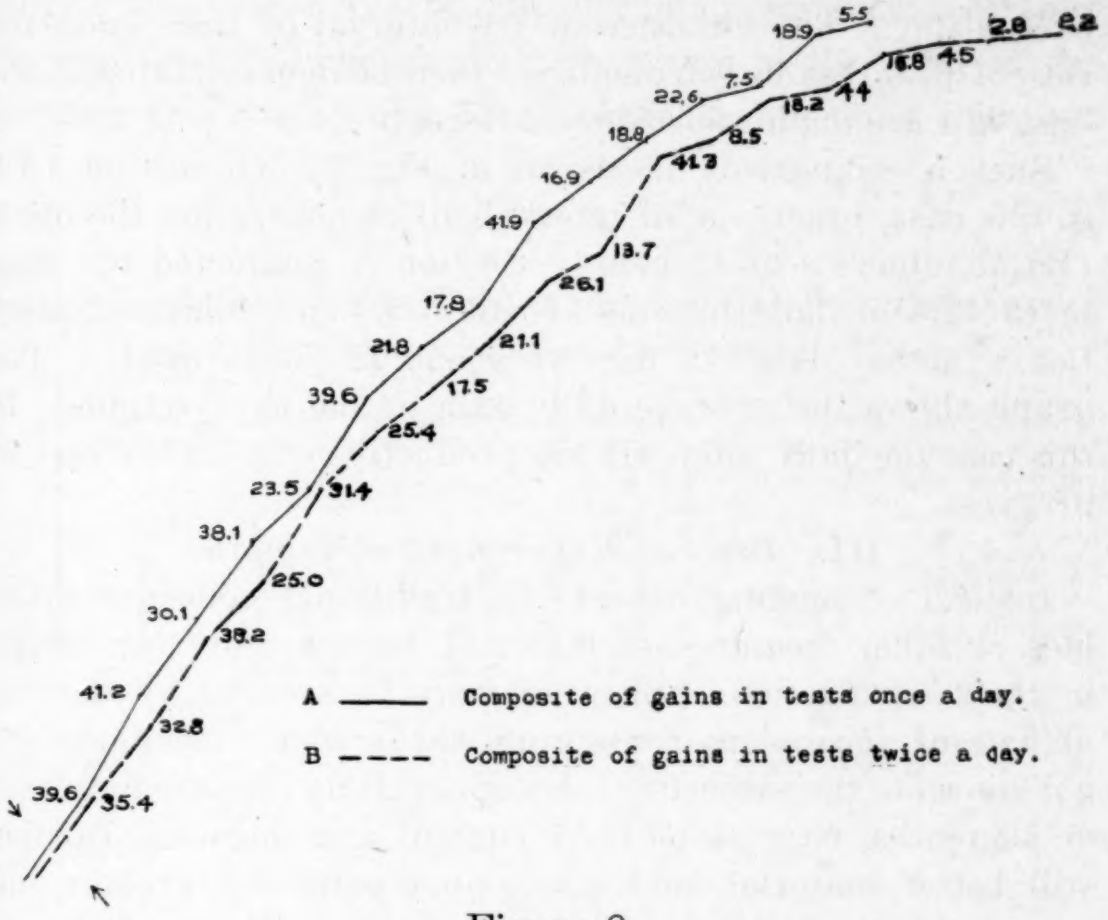


Figure 8.

is of interest, as it frequently gives evidence of some interference with the ability to do it when repeated after the practice on Fig. 5. The interference is developed as a result of the latter practice, and may be used to illustrate the so-called "negative practice" of Judd. If there is a gain, it is seldom equal to that which the subjects expect will result.

For a complete experiment check tests may be made, for example, on another class to determine the average gain that

may result from a second trial after an interval corresponding to that in which the practice was carried on in the first class, but in the case of the second class giving *no* practice.

If the class is large enough, variations may be introduced into the experiment. The class may be divided into two parts, one division doing the practice at frequent intervals of from four to six hours a day, the other division performing it but once a day. The influence of the interval of time upon the rate of progress in learning may then be demonstrated if the intervals are made sufficiently different.

Such a comparison is shown in Fig. 8, one section (A), in this case, practicing at intervals of 24 hours, and the other (B) at intervals of 12 hours. Section A completed the tests in 15 days of daily practice; section (B) in 18 days of practice with two trials a day at about 12 hours apart. The graph shows the average daily gain of the two sections. In this case the daily intervals are productive of a higher rate of progress.

III. *Practice Experiment in Memory.*

Instead of making use of the traditional nonsense syllables or other meaningless material, results more significant in their educational application may be secured by the use of lists of vocabulary containing words whose meanings are not known to the subjects. Lists of carefully prepared phrases or sentences, because of their content and meaning, furnish still better material, and give opportunity for greater improvement than lists of isolated words. For students of foreign languages the test imposes no particular hardship; in fact, it generally gives the pupil a new conception of the possibilities of memory efficiency. Memory for all sorts of material is capable of marked improvement in the case of practically all except those who are already considerably practiced. It is a good deal more economical to commit to memory after a relatively high level of practice efficiency has been reached than to do the work at the low level which the unpracticed memory represents. It is usually a surprise to the

pupil to discover how much improvement is possible when he sets himself to the task as a definite experiment.

In the case of the first six subjects listed in Table I the English meanings of from 30 to 50 unfamiliar words of either German or French vocabulary were comitted to memory daily. The object was to note the minimum time necessary to learn to recall the English equivalent at the sight of the German or French word. No attempt was made in this part

I

Improvement by Practice in the Ability to Memorize German and French Vocabularies and English Poetry and Prose.

1–6—Practice in Learning French or German Vocabulary. 7–12—In Learning Poetry.

Subject	Subject matter	No. Words or Lines Daily	No. Days of Practice	First Record / Lowest Record / Gain in Min.	% of Gain	Total No. Words or Lines Learned	Total Time in Hrs. and Min.	Transferred Effect of Practice: Subject-matter tested	Time before Practice / Time after Practice	% Gain
				M. M.			H. M.			
1	French Voc....	50	21	30—13=17	57%	1050	6—22	French Verse...	20—15	25%
2	German "	35	20	30—12=18	60%	700	6—2	German " ...	20—18	10%
3	French "	35	18	30—14=16	53%	630	5—54	English " ...	19—16	17%
4	" "	30	22	33—15=18	55%	660	8—6	" " ...	30—28	7%
5	" "	30	20	40—15=25	62%	600	7—37	French " ...	30—20	33%
6	German "			30—13=17	57%			German " ...	2.—15	25%
		Lines				Lines				
7	Victor Hugo...	32	15	38— 7=31	82%	480	3—22	Browning.....	25—12	52%
8	Horace's Odes	18	16	30— 8=22	73%	288	3—41	Norse Poem.....	12—10	17%
9	Paradise Lost.		20	38—12=26	68%			Chem. Formula	21—22	0%
10	Browning.....	17	13	30—12=18	60%	221				
11	Enoch Arden.		20	40—18=22	55%			Burke.....	20—16	2 %
12	Tennyson.....		26	20— 7=13	65%					

of the experiment to guarantee the permanence of the memory work. The experiment usually lasted about twenty days. The time of the first and the lowest record, the gain in minutes and in percentages, the total number of words learned

and the total time expended are indicated in the various columns of the table. Subject 1, for example, learned fifty French words daily for twenty-one days, beginning with thirty minutes at the start and reducing the time necessary by practice to thirteen minutes, making a gain of seventeen minutes, or 57%, on the basis of the initial time. As a result of the practice over one thousand new words were learned, at least for the time being, in less than six and one-half hours. The ordinary vocabulary with the exception of paradyms and declensions, usually learned in a semester's work in university classes is, I am told, less than half of this. The question of the permanence of such learning is one which naturally at once arises. This point may be tested by relearning after a lapse of a few weeks or more the lists which were learned early in the practice and those learned late and most easily, and comparing the results as regards permanence. This point is too complex to admit of full discussion in this paper; it may be sufficient to add that careful experiments have indicated that while it takes relatively somewhat more time to relearn those which were learned with the least time, the absolute time does not differ much. As a result of the relearning, both sets of words are again in mind at a less expenditure in the total of time for those which are well learned when the practice efficiency is at its highest.

It is not intended in this article to discuss the pedagogical significance of such an experiment as this, except as it serves as an illustration of the value of the practice experiment itself. It is interesting, however, to note that at the present time we are seeing in the classics, at least, the publication and use of lists of vocabulary of the various authors read in an effort to replace the wasteful practice of thumbing dictionaries. As stated above, lists of short sentences containing the necessary vocabulary would make easier memory material; but the lists, as they stand, furnish excellent opportunity for testing the merits of learning them as definite practice experiments where the powerful, if elementary, incen

tives which come from concentrated effort at improvement may be brought into service. Such use of the practice experiment in language work has the further advantage: that, as students in their reading and translation come across the words which have been memorized, this use of translation of them serves much the same purpose as relearning would do. It has been demonstrated in the experiments referred to above that this is a most economical method of learning. Words which, as the result of practice, are learned in a minimum of time may be relearned in about the same time as those which, because they were learned at a low level of practice efficiency, took a relatively long time for memorization. After relearning, both lists of words are at least for the time being equally well before the mind, and a second and third relearning after long intervals of time,—when that is necessary—still leaves a very considerable margin of saving in time and effort in favor of those words which have been learned at a relatively high level of practice efficiency.

IV. *Transference of Practice.*

Further tests on the general influence of special practice of the sort indicated in the preceding experiments may also be made in memory and by repeating the usual experiment as first employed by James. Before beginning the practice with vocabularies or other matter—which is usually spoken of as the *practice series*—the student may commit to memory a limited amount of other sorts of material and by learning a similar set after the end of the vocabulary practice—this is the *test series*—may note the effect of the practice on the latter. These results should be checked by having another class or a part of the same class learn the test material at the same intervals of time, but without doing the practice series. It may thus be at least roughly determined how much of the improvement is due to the test series itself and how much to the practice. The failure to do this gives a basis for very serious criticism of the recent work of Ebert and Meumann on this subject.

The results of such an experiment in the transference of practice are shown on the right of Table I. The results of the "check" experiment are not given.

These experiments give the student a much better conception of what is meant by practice and the general influence of special practice than a considerable amount of description of the experiments of others, and will usually be found by students and instructor to be worth the extra expenditure of time which is necessary for their satisfactory completion.

EXPERIMENTAL PEDAGOGY IN FRANCE.[1]

G. VATTIER,

University of Caen, France.

Scientific pedagogy, or paidology, as it is also called, has succeeded to the old pedagogy, to the pedagogy of tradition. Experimentation, which has pushed its way into all the sciences one after another, was bound to make its appearance in the science of education. It is natural that the progress made by the borderland sciences as the result of experiment should have roused pedagogy to new activity, opening to it a new pathway. Pure theory, abstract conceptions, had to give place to precise measurements; the results obtained by psychology and physiology have penetrated pedagogy, infusing into it new life and rendering it scientific and rational. Scientific pedagogy is now firmly established.

To the Americans unquestionably belongs the credit for the new trend given to pedagogy. They call it "child-study," and even today they take the front rank in this science. But Germany, which holds second place, follows them closely. In France, pedagogy, which is regarded with ever-increasing favor, has progressed very rapidly in the past few years, not only in point of laboratory researches, but also in respect to practical applications. I shall endeavor to show in detail the attempts which have so far been made in France to develop experimental pedagogy—attempts which might have been much more numerous if less prejudice or indifference and more boldness and initiative had been manifested.

Up to 1898 researches were carried on only in the laboratory of the Sorbonne, and even these were not devoted exclu-

[1] Translated from the author's manuscript.—J. C. B.

sively to pedagogy. In that year, however, the council of the University of Lille decided to establish a laboratory, which was placed under the direction of M. Lefèvre, professor in that university, and which, according to the ideas of the latter, should be "not merely a school where students come to be instructed in truth already discovered, but a workshop in which we shall busy ourselves with formulating and solving a vast number of problems connected with the psychology of childhood and its immediate applications to pedagogy" (11).

In 1905 M. Alfred Binet, director of the laboratory of the Hautes Etudes at the Sorbonne, established in a primary school at 36 rue Grange aux Belles, Paris, a laboratory of experimental pedagogy in order to "infuse into school instruction the results of the most recent pedagogical researches,"—results which up to that time had been known only to specialists (9). The following is a brief resumé of some of the investigations undertaken:

Intelligence has been measured by means of a series of tests constituting what M. Binet and his collaborator, Dr. Simon, have called a "*metric scale of intelligence.*" The first and best of all the tests employed consists of showing a picture to a child and having him name the objects represented in it. We thus discover what has impressed him most, what has been his controlling idea, what is the degree of his mentality, how he perceives, interprets and reasons. Moreover, this test has the enormous advantage of amusing the children and of readily calling forth responses from them. The replies naturally vary according to the age of those experimented on. The older they are the more objects they name, the more accurately they describe the persons and comment upon the things they see. The following will serve as examples of other tests. At the age of four years the children are asked to name and define certain objects placed before them, to compare weights, to copy a square, to point to the right or left ear. At a more advanced age they are

asked to read, to tell their age, to give the number of their fingers, to draw a rhomboid, to pick out a coin, to name the days of the week and the months of the year. At 11 years of age they are required to criticise sentences which contain nonsensical statements, to repeat the greatest possible number of words in a given time, and to define certain abstract terms.

The principle that governs this scale of intelligence is evident from the preceding: It is to arrange a certain number of tests of increasing difficulty, tests which shall be as rapid and accurate as possible, try them on a large number of children of different ages, note the results obtained, and select those tests which succeed for a given age and in which younger children fail. In this manner a metric scale of intelligence has been constructed which enables one to determine whether the subject has the intelligence of his age, or is retarded or advanced. Experiments were made not only on elementary school children, but also on adolescent boys and girls, and on soldiers. (8, and 4, p. 124ff.)

By an analogous procedure MM. Binet and Vaney measured the degree of learning, the knowledge, of children; for this they devised a system of questions of the same general tenor throughout. The degree of learning is compared with that of the average child of the same age and the same social condition, and the result obtained is transformed into a notation indicating whether the knowledge of the child is normal or not. (4, p. 23ff.)

In like manner investigations have been made in regard to memory. Pictures representing various objects are shown to children for a few seconds; the pictures are then covered and the children are asked to write from memory the names of the objects seen. Another method, superior to the preceding, consists in having the children study for a definte time a selection of prose or poetry, and then asking each to reproduce what he can recall. The experiment should be tried several times, and, if the material is poetry, note should be

made of the number of lines reproduced immediately after learning and one week later. (4, p. 178ff.)

For several years methods have been proposed for measuring intellectual fatigue; for example, by means of the dynamometer. (6.) Attempts have been made to determine the branch of study causing most fatigue, the influence of physical work on mental fatigue, and the types of fatigue; while the problems involved in the recovery from fatigue have also been successfully attacked. (12, p. 35ff.)

On the important subject of aptitudes almost no investigations have been made. M. Binet has studied two celebrated calculators, Diamandi and Inandi, and has made some observations on different types of intelligence: the reflective and the intuitive, the objective and the subjective, the practical and the literary. He finds himself opposed to the view of Thorndike on the one hand, for whom mind is only a jumbled collection of juxtaposed and quasi-independent faculties, and to that of Spearman on the other, who maintains that intelligence is unitary, that there is within us a faculty which deserves the name of general intelligence, and that there is a correspondence between the degree of even our most widely separated activities. According to M. Binet the truth lies midway between these extremes. It is certain, he says, that one never finds an almost complete independence between one subject of instruction and all other subjects. On the other hand there are no inverse corrolations. Excellence in one subject does not imply weakness in another. Finally there exists a faculty which acts in opposition to aptitude, i. e. general application to work.[1] The "*dunces,*" according to Binet, are only children whose aptitudes have been misunderstood and who are fitted for, and show themselves successful in, manual labor. The idlers whose slothfulness is

[1] Aptitude means excellence in a particular line. But through close application to different kinds of work a general ability of attacking a subject is developed which tends to equalize the differences in accomplishment due to specific aptitudes.—TRANS.

due to moral causes are a negligible quantity. Their indifference is due either to weakness of intelligence or memory, or to weakness of constitution. (4, p. 237ff.)

But it is not sufficient to examine the mental condition of children. It is not less useful to know their physical condition; for, as M. Binet says, the failures of pupils are often explained by their lack of nourishment, and every one knows how close is the bond between the physical and the moral. Accordingly the height of pupils has been measured, their weight determined, their biacromial [2] diameter taken, and their cranial volume computed. Their muscular strength has been measured by the dynamometer and their lung capacity by the spirometer. Of especial importance are the frequent and careful tests to determine whether the children's vision is normal or defective. At the demand of M. Binet, and in conformity with the report of M. Bonnaric, inspector of the Academy, M. Liard, Vice-Rector of the Academy of Paris, ordered in October, 1907, that the "*optometric scale*" devised by MM. Binet and Simon be used by the instructors in the primary schools of the departments around Paris to determine the condition of the children's vision. The number of pupils whose vision is abnormal has been found to be considerable. It would be no less useful to know the auditory acuity of school children, since, if we are to believe the most recently published statistics, fully 75% of the pupils in France are partially deaf. (2.) Finally, a very happy idea of Dr. Legendre, which he would like to see realized in the whole of France, is a system of individual health cards containing all the information furnished by periodical physical examinations of pupils, and constituting a permanent health record. (9.) It would be desirable to have a similar plan worked out from the intellectual point of view.

But here a question arises which we cannot pass over in silence. Whose duty is it to make all these tests? M. Binet,

[2] The distance between the extremities of the two shoulder blades.—TRANS.

who, like M. Compayre, Inspector General of Public Instruction, has unceasingly encouraged psychological experimentation among teachers, is of the opinion that they alone should assume this task. Only in exceptional cases should and could the physician be called in. By no means does M. Binet overlook the criticisms made by William James; but psychological knowledge ought not to harm those who teach, and however inept teachers may be at the beginning, they are in a position to rapidly acquire an amount of knowledge in this subject sufficient for them to give a good account of themselves in experimenting on the pupils entrusted to their care. (2.) Among the majority of teachers (unfortunately there are some exceptions) we find a great desire to assimilate these new theories and much good will in applying them. Their great need is better training; but one is justified in being very optimistic, after having seen the work done by teachers of abnormal classes.

Besides these tests numerous investigations have been made by M. Binet on the consumption of bread in connection with intellectual work (5); by MM. Binet and Henri on the memory of words and phrases (7); by the "*Société libre de l'étude psychologique de l'enfant*" on rewards and punishments, lying, pupils' plays, undisciplined and rebellious children, and on the measure of memory. At the initiative of the same society M. Malapert has studied the emotion of hatred in children. (14.) M. Chabot, professor of the science of education at the University of Lyons, has undertaken several investigations in that city, among others on the variations of attention, on the difference of mental fatigue in children on different days of the week, and on the subjects preferred by pupils. (5.) An investigation similar to the latter was made in the schools of the north by M. Lefèvre and included 37,000 children. (16.) Researches have been undertaken on the physical and mental condition of pupils and on laggards. M. Larguier des Bancels has studied methods of memorizing, M. Binet, children's fears, (3) and M. Vaschide,

the influence of prolonged mental work on the rate of the pulse (17). Some of these investigations have been carried on by the questionnaire method. If all have not given conclusive results they at least show us clearly the direction in which these new studies tend. The results of these investigations have been published chiefly in the "*Année Psychologique,*" founded in 1894 by MM. Binet and Beaunis. At first paidology had only a limited space in the volume published by M. Binet and his collaborators, but, expanding year by year, it now occupies almost half the volume. Numerous articles and collective reviews are devoted to the subject.

Moreover, chairs of the science of education have been established,—as, for example, that formerly occupied by M. Marion at the Sorbonne, and that of Lyons, at present held by M. Chabot,—and in 1904 educational conferences were inaugurated under the patronage of M. Liard at the "*Musée Pédagogique*" in Paris. Finally, in 1899 the "*Société libre de l'étude psychologique de l'enfant*" was established in Paris by M. Buisson, professor of the science of education at the Sorbonne, and deputy of the Seine, and placed under the patronage of MM. Ribot, professor at the College de France, and Bédorez, director of primary instruction. M. Binet is its president. This society is composed of physicians and members of the superior, secondary and elementary teaching staff. The members meet at stated periods to report on their experiences or to undertake collective investigations on special aspects of pedagogy. This organization has been called a "*co-operative society for work,*" and comprises different committees, each of which concentrates its attention on a particular problem. Five times a year it publishes a bulletin in which are reported all the results of the investigations undertaken.

To the condition of abnormal children the attention of French educators was early directed. Indeed to France belongs the honor of having first established the principles for the education of defectives, and she it was who made the

first attempts at the practical application of those principles. Later she fell behind other countries in the active pursuit of these investigations, and it is only in recent years that she is beginning to regain the position which she formerly held. In 1904 a commission was named by the Minister of Public Instruction for the purpose of considering measures which should provide for abnormal children such education as would be suitable and profitable for them. Certain establishments for retarded children had already been founded by private initiative, as that of Dr. Bourneville, for example, and the Board of Charities had established some schools in hospitals for abnormal children, the most important of which is the Salpétrière. In 1905 two classes for abnormal girls were inaugurated in the Department of the Seine at Paris, and a class for boys and one for girls at Lavallois-Perret. These special classes, called "improvement" classes, were intrusted to trained teachers who had made a study of the special pedagogy of defectives. In the experimental class started in a primary school in Paris the defectives are not separated from the normal pupils; the latter act as "little mothers" for the young defectives. Older pupils act as monitors, remaining almost the whole day in the class of abnormals and helping the younger ones. A child who has served as monitor does not return for a month or two, in order not to take away the spontaneity of the normal children nor to spoil the defectives. Twice a week the monitors come to give individual instruction to their pupils. Each little teacher serves for a fortnight, and at the end of her period of service she writes a report of two or three pages on what she has observed in connection with her pupil. The following fortnight she is replaced by another, in order that the eager but short-lived zeal of these young tutors may not have time to become exhausted. Of course, this organization is only possible with the very attentive collaboration of the director. (4, p. 334ff.)

The chief aim in the training of defectives is to arouse emulation, and the method of accomplishing this has been called mental orthopedy, in comparison with physical orthopedy for the correction of bodily defects. For this purpose we begin with exercises in immobility; the pupils stand motionless as statues for perhaps one minute once a day. Then they are asked to perform exercises demanding motor control, such as carrying plates full of water. An exercise frequently used is the strength test with the dynamometer. Before each trial, in order to stimulate the pupil, the result of the preceding trial is called out, and while the aim is not to increase the physical strength of the child but to teach a lesson in putting forth effort, it is soon seen that the average of the pressures steadily increases. The objects continually kept in view in the training of defectives are stimulation of attention, memory, perception and will, inculcation of lessons of discipline, *teaching the children how to learn* rather than trying to increase their knowledge,—in short, making them active. (4, p. 150ff.)

Contrary to the old pedagogy, which endeavored to establish an ideal type of pupil and to force every child to conform to this fictitious type as closely as possible, it has been found preferable to estimate the pupil's progress by a comparison with his own previous standing. One cannot too highly praise M. Boitel, director of the Ecole Turgot at Paris, who conceived the idea of constructing graphs as a stimulus to individual emulation. Each week the child traces the curve of his progress from data which he has obtained in the course of his daily work. The ascending, horizontal or descending nature of the curve indicates his standing. (12, p. 71-72.) It is to be hoped that these graphs, successfully employed in classes for defectives, will be more generally used with all classes of pupils. They are already being introduced into a number of institutions.

These early efforts were attended with excellent results, and had a most favorable effect upon the educational prac-

tice of the country. In 1907 two classes for defective boys were opened at Bordeaux at the initiative of Rector Thamin. In the same year, following the meeting of a commission organized under the presidency of Senator Leon Bourgeois for the purpose of studying the means of securing primary instruction for all abnormal and defective children, a bill dealing with this subject was introduced in the chamber, and on April 15th of last year a law was enacted relative "to the organization of 'improvement' classes in public elementary schools, and of autonomous 'improvement' schools for defective children." There was indeed great need of such a law to secure a stricter enforcement of the compulsory education measure of March 28, 1882, particularly since the preceding laws applied to normal children exclusively. It is superfluous to point out the value of instruction especially adapted to defectives, both for their own good and for that of society. Besides, the studies made on them, constituting what has been called "*pathological pedagogy*," may be of great advantage to normal children, just as the medical clinic throws light upon the normal conditions of health.

The most important and most interesting provisions of the law are the following: The annexed classes are to receive children from 6 to 13 years of age. The autonomous schools, since they include part-time and full-time boarding schools, may retain their pupils until 16 years of age. No class is to include children of both sexes, but the autonomous schools may maintain two sections, one for boys, the other for girls, under the same direction. The pupils shall be given a medical inspection at least once each semester, and the observations shall be entered in a book showing the mental and physical history of each individual. A commission composed of the primary inspector, a director or master of a special school and a physician shall determine what children may not be admitted to or kept in the public primary schools and may authorize their admission to a special class or a special school. Finally, a committee of patrons shall be appointed for each

special school, constituting a kind of administrative council. (10.) The teachers must have obtained the "*certificate of fitness for teaching retarded or defective children.*" Candidates qualify by a year's residence in a special establishment and a written examination which tests the candidate's knowledge of the physiology, school hygiene, psychology and pedagogy of defectives. The following indicates the field covered by the examination for this certificate: General characteristics of defective children.—The conditions which give rise to idiocy, imbecility and feeble mindedness.—External appearance of defectives.—Sense organs.—Instincts.—Movements and volition.—Language.—Intelligence and special aptitudes.—Brief outline of medical treatment and hygiene.—Education.—Internal organization of schools.—Courses of study.—Utilization of defectives.—Struggle against the causes. (13.)

As to the organization of these classes the number of pupils admitted to a single section shall be about 15, increasing to 20 in exceptional cases, but never exceeding this number save for certain physical and manual training exercises. Instruction shall be given every day in the week except Sunday and a half day on Tuesday. The time shall be divided as follows:

8:00— 9:30	Recitation.
9:30—10:00	Recreation.
10:00—11:30	Recitation.
1:30— 3:00	Recitation.
3:00— 4:00	Recreation.
4:00— 5:00	Recitation.

Each recitation shall be broken by a short intermission. (1) It will be well to give the course of study entire, as well as the accompanying instructions.

COURSE OF STUDY.

Paper folding, box making, measuring, weighing, construction and joining in cardboard and wood.

Singing.

Supervised plays and games.

Walking, and working in the garden.

Free drawing, copying, and modelling in clay.

Exercises in pronunciation and articulation.

Rudiments of reading and writing, with attention to the mechanics of the activities involved. Ask numerous questions on the meaning of words, the why and the how of things.

First exercises in number. Counting from 1 to 10, 10 to 20, 20 to 50, 50 to 100, etc. Have the pupils handle and combine concrete objects. In the later years teach them computation, i. e. addition, subtraction, and multiplication of simple numbers, always making use of concrete objects.

The elements of geography. Study the shape and the details of the earth's surface, beginning with the topography of the garden, the school, the district, etc.

Object lessons: the study of ordinary objects placed before the children. Describe their color, form and use. Make use of frequent repetitions.

Lessons in practical life. Tell stories, anecdotes and short biographies, and have the children relate them in answer to questions. From these stories draw lessons of practical morality.

Beginning of instruction in the simplest tasks of the workshop and the garden. Special gymnastic exercises.

GENERAL INSTRUCTIONS.

Teachers are to follow the program of the primary schools in so far as it is adapted to the abilities of their pupils. Very frequently they will have to rest content with reading, writing and the elements of number. They will endeavor to gain and hold attention by the attractiveness of what they show and say, and by the variety and novelty of the exercises. They are to use word for word recitations only with discretion, and are to avoid definitions, rules and formulae. They are to make sure that pupils use in recitation only those words

and phrases whose meaning is understood. They will very frequently have recourse to object lessons. Instruction shall be given by the direct presentation of objects, by pictures, and by familiar stories which direct the attention of the children to the observation of action and of life.

Particular attention shall be paid to the following exercises:

1. Singing and music, of which defectives are usually very fond.

2. Exercises in language and articulation, to correct the faults of pronunciation usually frequent in this class of children.

3. Simple and rational gymnastics, avoiding all trace of athleticism, and, where possible, making use of a musical accompaniment to rhythmatize the movements.

4. Plays and games of speed and skill, organized and directed by teachers so that the apathetic and obstinate children will not be isolated from their comrades.

5. Lessons in practical life, such as will put the defectives in a position to support themselves and adapt themselves to their surroundings. The smallest children should be taught to wash and dress themselves and to have good manners at table; the older ones should be taught how to behave in company, to write a letter, to count their money, to save it, and to find their way about; the most intelligent should be taught some ideas of elementary hygiene, and especially the rules of morals, as these are particularly important for young girls of weak intelligence, who are the more exposed on account of their feeble-mindedness.

6. Manual training. The aim of the "improvement" schools is not merely to secure for defective children the instruction to which they have a right, but to prevent their becoming a burden on society. Thus their instruction in manual training should be clearly directed toward apprenticeship and its concrete applications. Especially in the separate "improvement" schools, which keep their pupils until they are 16 and

18 years of age, should manual training be developed.[1]

In the rural districts the pupil should be directed preferably to agricultural pursuits. For this reason it is desirable that a school garden should form a part of the equipment of every "improvement" school.[2]

In urban communities the workshops should be conducted with a view to a rational and complete apprenticeship in accordance with local needs. Simple occupations which can be pursued anywhere are the best, such as woodworking, iron work, garment making, shoemaking, embroidery, etc., taking care that the trade chosen be completely learned.[3]

From the preceding discussion one can see how much progress pedagogy has made in France in the last few years, and how greatly the scope of its activity has been broadened. The movement is progressing methodically, though too slowly. Its advance is due in great part to M. Binet, whose name I have mentioned so often in the course of this article, and who is at present the uncontested chief of the new pedagogy in France; but in spite of his efforts, in spite of the efforts of his collaborators and of other men not less eminent, there still remains much to be done, especially in the way of practical applications, and it is just in order to further the move-

[1] Half the time, sometimes more, is to be devoted to exercises in manual labor. It is necessary to catch the child's attention, to stimulate and perfect his powers of imitation, then by observation, by reflective analysis of his own and of the teacher's movements, and by the examination of his tools, their proportions, and their relation to the task in hand, to develop his judgment, so that when he is confronted by a new task an appeal may be made to his memory and to his reasoning powers.—*Instructions relative to special schools.* Bulletin de l'Instruction Publique, 28 Aout, 1909.

[2] In rural localities the children are to be given special training in the work of gardening and agriculture. These are the occupations which they will prefer and in which they will succeed best, and in these they will most readily find employment when they leave the school.—*Ibid.* Bulletin de l'Instruction Publique. 28 Aout, 1909.

[3] In the urban centers one or more workshops are always to be connected with the school. The trades chosen should be the best known and the most easily learned,—those whose manufactured products can be most readily disposed of in the region.—*Ibid.* Bulletin de l'Instruction Publique, 28 Aout, 1909.

ment of pedagogy in this direction that M. Binet has recently written his very interesting and authoritative book *Les idées modernes sur les enfants,* from which I have so freely borrowed.

In conclusion, let me express the hope that the applications of pedagogical research may become more numerous from day to day, that the number of those who contribute to spread these ideas may increase, and that their efforts, so worthy of interest, may be crowned with well deserved success.

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COMMUNICATIONS AND DISCUSSIONS.

NOTES ON THE RECALL OF NONSENSE SYLLABLES.

In the course of a discussion of the experimental psychology of memory before a class of Sophomores in educational psychology last year, I placed upon the blackboard for memorization the following series of nonsense syllables: *Pra, ver, spe, iss, mey, oph, lom, bry, der, cul.* These were read by each student until a single correct reproduction could be made, were then erased and were not referred to subsequently.

One of my students, Mr. C. W. Hagen, Jr., now reports that, while walking along the street recently, he chanced to think of his work in that course, visualized the room in which the class had met, and found to his surprise, that this list of nonsense syllables suddenly came back to him. At my request, he wrote out the list (which he had originally learned, and which he now recalled, in auditory terms) as follows: *Pre* (pronounced *pray*), *ver, spe, ish, meh* (pronounced *may*,) *oph, lum, bre* (pronounced *bree*), *der, cul.* In auditory terms, therefore, the series as reproduced some nine months after it was learned contains only two minor errors, *ish* for *iss* and *lum* for *lom;* the order is correct.

In view of the many records of exceptional recall, this incident cannot be said to be at all extraordinary, but it seems to me to be at least unusual, because (1) the material was nonsense syllables and hence unrelated to the observer's general stock of ideas; (2) the original learning had been done as a mere incident in the day's work, with no intent to secure permanence, and (3) the recall took place in a certain sense spontaneously, in so far as the observer was not at the time trying to recall the list or thinking expressly of memory tests.

I was tempted to rate Mr. Hagen's performance as quite exceptional. A few days later, however, opportunity offered for the testing of 13 other members of the class. One student, Miss C. M. Stivers, then reproduced the original series as *pra, ver, spe, iss, me, opf, lum, bra,*——, ——, which shows an approximately correct auditory recall of eight of the ten syllables. For a further test, the ten syllables were written in 'helter-skelter' order on the blackboard, and the students in question

were asked to essay their proper arrangement by the 'reconstruction' method. Miss S. accomplished a perfect series. Five students were quite unable to arrange the syllables; seven others made the attempt with varying success. These last records were graded by the simple, though arbitrary plan of computing for each syllable given, the number of 'steps' it had to be moved in the series to bring it to its proper position, with the result that the scores 2, 14, 18, 22, 24, 44 and 48 were secured. The last two indicate virtually a chance arrangement.

It seems to me that, from the point of view of the teaching of educational psychology observations such as these have some value for classroom illustrations of the nature of retention and recall. For one thing, although we not infrequently believe that we recall exactly the details of some long forgotten incident, we have, as a rule, no means of verifying this belief, and it is a fair presumption that the seeming exactness of the recall is largely illusory. Here, fortunately, the original experience was a matter of record.

Again, students are often interested in the familiar query: is anything absolutely forgotten? The stock instances to the contrary, such as Coleridge's servant-girl story, although so striking in nature, are felt to lack, in a way, that certainty or reality which a less striking instance like the present one, drawn from the experience of classmates, may serve to supply.

It would be a simple matter for instructors in educational psychology to extend these observations and to obtain, perhaps, valuable statistical evidence of the possibilities and nature of long-term retention and recall of nonsense syllables.

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BASEDOW'S ELEMENTARWERK.

I am anxious to turn the attention of all who are interested in the history of educational psychology to the excellent new edition of Basedow's Elementarwerk, which Ernst Wiegandt has published in Leipzig (Stechert, New York). The text fills two volumes and the third volume contains a hundred plates with Chodowiecki's famous illustrations. The whole is edited and introduced by Fritzsch and Gilow. It is prettily bound in the style of Basedow's time. The volume of pictures alone is an inexhaustible source for the study of culture in the eighteenth century

and at the same time a real work of art, as the reproduction of the masterly coppers is perfect. But still greater interest ought to be aroused by the two volumes of text, which with their system of educational philanthropism offer much material which has not only historical interest, but manifold suggestion for the modern student of pedagogy. A book which has been so extremely influential for the growth of educational ideas ought to be welcomed in every teacher's library.

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THE BOSTON MEETING OF THE NATIONAL EDUCATION ASSOCIATION JULY 2-8, 1910.

Since the National Education Association is the great national organization expressing the high regard in which public, universal education is held in this country, its proceedings are worthy of consideration as an indication of the general trend of educational sentiment and activity throughout the United States. To present in a few pages the substance of the addresses and discussions at these meetings is no easy task, so varied were the interests of the convention, so many were the section meetings in progress at the same time. Including the general sessions, the Council, the various departments, and the affiliated societies there were 28 sections in session during the week, many of them meeting at the same time in different parts of the city, and at these meetings more than 200 papers and addresses were given. It must suffice, therefore, to merely comment upon certain dominant tendencies of the convention.

In spite of the fact that the railroads, by their reluctance to grant favorable rates, discouraged many from coming, there was a goodly attendance representative of all parts of the country. The *Boston Transcript* gave the total registration of both active and associate members as 17,000, which was about half the registration at the Boston meeting seven years ago. The pleasant weather and the very cordial hospitality of the people of Boston combined to make the occasion a delightful one for the visitors. The section meetings were held almost exclusively in the mornings, the afternoons were devoted to social functions and sight-seeing excursions, and in the evenings the general sessions convened. One of the attractions of the convention was the address of President Taft at the Harvard Stadium, July 4. The President took as his subject the declaration of independence as conceived

by the founders of the republic, interpreted by Lincoln in the emancipation of the slaves, and applied to present-day conditions in the Philippines. The speaker defended the policy of the United States in those islands as exemplifying in the highest possible manner the fundamental conceptions of the declaration of independence, and made an eloquent plea for the education of the Filipinos in the principles of liberty and self-government in order that they might soon become completely free and independent.

The topic most prominently in the foreground during the deliberations of the Association was probably that of vocational and industrial education. At least 50 of the addresses were concerned more or less directly with the problems involved in such education, and a number of supplementary conferences were held. The subject was introduced at the sessions of the National Council by the discussion of the "Report of the Committee on the Place of Industries in Public Education." Professor Charles R. Richards, Director of Cooper Union, New York City, presented the report of the committee, and showed that industrial schools should be related to the industries of the locality which they are to serve. Dr. Jesse D. Burks, Director of the Bureau of Municipal Research, Philadelphia, held up to ridicule the so-called manual training work of the elementary schools, claimed that real manual training had never been tried, and urged the establishment of experimental elementary schools in which the whole course of study should be dominated by the vocational idea. Dr. David Snedden, Commissioner of Education for Massachusetts, speaking of intermediate industrial schools, discussed the kind of training necessary for boys and girls from 14 to 16 years of age,—pupils whose need of vocational education is doubtless most acute. He deplored the tendency to bookishness which characterizes many industrial schools, and asserted that "vocational education demands concrete, productive, practical work that will fit boys and girls to earn a living." Book knowledge should be resorted to only in answer to questions which develop out of concrete vocational situations. It is worse than futile to try to teach vocations from books. Vocational education should provide a basic equipment for the industries. Just what constitutes such basic equipment for any group of industries can only be determined by careful study and experimentation within the group. Superintendent Charles T. Keyes, of Hartford, Conn., dismissed industrial education in the high school with the statement that it could only be profitably considered after

the problem had been solved for the upper grammar grades. At present there is no demand for it.

The undue prominence of bookishness in science education was mentioned by Professor W. J. V. Osterhaut, of Harvard University, before the department of secondary education as a reason why the vocational idea should receive attention in the high schools. "The introduction of material from agriculture and household arts will put an end to a most unfortunate kind of instruction now prevalent, namely, instruction by teachers who have only a book knowledge of their subject. Further, it will enable the pupil to make immediate application of his knowledge, and so make it a vital part of his mental equipment. Best of all, it will lead him to inquire and experiment for himself." At the same time, according to Professor W. R. Hart, Amherst Agricultural College, there will be a desirable reduction of the amount of science taught in the high school. Much of past science teaching has not been adapted to the learner's mind. "Only those sciences deserve to be widely studied whose facts have become socialized, i. e., intimately related to the vocational life of the people." Professor S. B. McCready, Ontario Agricultural College, continued in the same vein regarding the teaching of botany. "It is not so much botany as plants; not so much plants as pupils; not so much the logical development of a science as a preparation for life. The teaching is not for the sake of a subject, but for the sake of a boy or girl who is to 'live a life and to make a living.'"

Arthur B. Dean, Chief of the Department of Industrial Education, New York State, recommended a grouping of pupils at the end of the sixth grade into classes leading to (1) the present high schools, (2) higher business schools, (3) higher industrial and agricultural schools. Such a segregation was opposed by others on the ground that it would create undesirable class distinctions, and that teachers and principals have at present no satisfactory basis on which they may determine the natural aptitudes of pupils. Furthermore, it is a well-known fact that life interests and their corresponding aptitudes frequently do not develop until a much later period.

That this matter of natural aptitudes and capacities is a crucial question in vocational education was fully recognized by Mr. Frederick P. Fish, President of the Massachusetts State Board of Education, in his discussion of "The Vocational and Industrial School." Mr. Fish said, in part: "The two things of the greatest importance for each

child are these: First, he should be understood. His physical and mental capacity, his character, tastes and inclinations, points of strength and weakness, the direction in which he can best be developed, should be known. Second, he should be trained and developed not on conventional lines, but in that way which is most effective for him in view of his special character and aptitude. Each child should be studied individually, and it would be a great gain to our race if parents themselves could be trained for this important duty."

At present, however, since parents lack the requisite training, the task will necessarily fall upon the teacher, and it is incumbent upon our institutions for the training of teachers to make better provision for this kind of individual child study. The study of the individual and the need of experimentation on the part of teachers in training to find out the kind of children they are best fitted to teach were the central thoughts of the address by Miss Emma L. Johnston, Principal of the Brooklyn Training School for Teachers, on "Training for Teaching." Everybody can teach somebody, but it is the duty of those in charge of training schools to help students to find the kind of teaching for which they are fitted, and thus prevent the lamentable waste of energy seen in the case of the "misfits."

The vocational idea was also prominent in the address of ex-President Eliot, of Harvard, on "The Value During Education of a Life Career Motive." Mr. Eliot urged greater emphasis on household and practical arts in elementary education, in order that the interest of pupils might be maintained by the evident vocational aim of their school work, and that they might be kept in school as long as possible. The actual training for a trade should be postponed until 16 years if possible. "Children with natural gifts and tendencies should be turned toward appropriate occupations by the teacher in consultation with the parents. Children who know their own minds by the time they are 14 years old should be helped to the life work which attracts them."

That the child's interests should be carefully studied and the work of the school adapted to them was emphasized by Superintendent H. B. Wilson, of Decatur, Ill., in his plea for a better motivization of the work of the elementary schools. "The school's first step in the solution of this problem is the discovery of a series of motives, varying from year to year and with different teachers, which seem to be normal to the children of a given community in each of the grades or years of the school course." This accords with the appeal made by Profes-

sor Judd last winter for a more careful and extended study of children's interests. We have books galore on abstract "interest," but we have little definite knowledge of the actual interests of children. That merely shows how much easier it is to theorize than to collect facts, and it is gratifying to find practical educators calling for the collection of such data as educational psychologists are anxious to see amassed. When principals and teachers become investigators the science of education will advance much more rapidly. A special opportunity for the study of interests is found in the English work of the schools, and the moral of the paper on "English as She Is Taught," by Superintendent Adelaide Steele Baylor, of Wabash, Ind., was that too much of the English work takes no account of children's interests.

President James W. Crabtree, of the Nebraska State Normal School, in discussing the "Criticisms of the Public Schools by the Laity," thought that the most important criticism and the one most worthy of consideration might be voiced as follows: "The school does not attach enough importance to what the pupil is to do immediately on leaving his studies. We must either keep our children out of the high school a portion of the time and teach them how to work and to love work, or else the schools should in some way meet this need. And why may not the schools do this service for our children?"

How the schools may meet this demand is a problem requiring extended investigations, and to correlate such investigations and make them effective and useful is one of the chief functions of the United States Bureau of Education. Commissioner Brown, in presenting his "Message from the Bureau of Education," advocated such an extension of its activities that it might become a clearing house for educational questions, formulating problems, starting investigations, and reporting results to the public at large. "Industrial education in its three main forms of trade schools, schools for housekeeping, and schools for rural life is every day raising more questions than anyone yet can answer," and a properly equipped Bureau could render great assistance by keeping watch on all questions of research in this field.

A second prominent topic in the discussions of the convention, although it did not receive as much attention as vocational education, was that of the exceptional child. Superintendent James H. Van Sickle, of Baltimore, presented the subject to the Council in the "Report of the Committee on Exceptional Children." In this report and in the discussion which followed it stress was laid on the need of skilled

psychologists and physicians for more accurate diagnosis of so-called defectives and incurables. What was not sufficiently emphasized is the desirability of more extensive studies of normal children by psychologists in order to establish norms or units of measurement of intelligence for given ages and grades, so that we may have some basis for a diagnosis of the degree of mental defect. At present school administrators do not realize the importance of such studies, and tend to discourage rather than encourage them. There was some discussion as to the advisability of removing defectives from the regular schools, and it was pointed out that parents and associations frequently show a decided prejudice against special schools. Perhaps the "special class" is the most satisfactory solution.

The meetings of the Department of Child Study were devoted very largely to the consideration of exceptional children. Dr. Maximilian P. E. Groszmann reviewed the symptoms of nervousness and other troubles of young children which might be taken as "danger signals" for their healthy development, and entered a plea for the better training of teachers in the diagnosis of such troubles. Dr. S. Philip Goodhart, of New York City, besought consideration for those atypical children who are frequently censured for perversity, moodiness or inattention or who are thought dull and stupid because of abnormal shyness, sensitiveness or absorption. Such individuals often show unusual intellectual attainments later in life, and if they were understood and properly treated in school they might show a much larger percentage of usefulness. These atypical children must be trained in power of concentration, and must have their perceptive and apperceptive powers exercised. Here again the burden falls on the teacher, and unless she has been trained to take something of the clinical attitude toward her pupils she will fail in her task.

State Superintendent Robert J. Aley, of Indiana, presented the claims of the exceptionally gifted child. Work with defectives is worth while, but work with exceptionally able children is far more worth while. "The forward movements of civilization are never led by the average man or by the masses of the people. They are always under the direct leadership of an individual who, because of his superior abilities and attainments, has stepped out of and beyond the crowd. The world has constant, continual need of leaders. Too many of the leaders of the past have been forced to train themselves in the school of experience. The ordinary school has failed to meet the needs of such students."

Superintendent Aley's address is in harmony with a vigorous agitation now carried on in Germany under the leadership of the great physical chemist, Professor Wilhelm Ostwald, for the more adequate consideration of bright pupils in the schools. We hope to give our readers a more extended account of Professor Ostwald's arguments in a later number of this JOURNAL.

At other meetings Professor Wm. H. Burnham, of Clark University, discussed the "Hygiene of Instruction," and Dr. H. H. Goddard, of Vineland, N. J., spoke of the relatively large group of feeble-minded children who have never been recognized as such, who clog the work of the regular classes and yet do not get adequate attention themselves, and who ought to be examined and placed in special classes. President G. Stanley Hall outlined the work of the National Child Welfare Conference and urged teachers to utilize their opportunities for scientific study. Dr. Frank G. Bruner, of the Child Study Department, Chicago, gave an interesting account of the education of the blind in schools with the seeing.

One of the most interesting of the general sessions was that at which President Lowell, of Harvard, discussed the subject of formal discipline and the transfer of training, on the basis of an investigation into the connection between success in the law and medical schools and previous success in college. This subject of the transfer of training the speaker characterized as the most interesting and vital topic for educators at the present day. Investigations seem to show that capacity acquired in one study, so far as it is dependent on subject matter, cannot be transferred to another; so far as it depends on method of study, it is transferable to a considerable extent to studies where the same method is applicable; so far as it depends on general conceptions or general moral and intellectual attitude, such as intensity of effort, diligence, etc., it is transferable indefinitely. President Lowell showed a diagram exhibiting the standing of men in the Harvard Law and Medical Schools from 1898 to 1908, and expressed his surprise to find that college excellence in history was apparently of little assistance to high standing in the law school, and that the same was true of science in the medical school. "The conclusion to be drawn would seem to be that it made comparatively little difference in regard to a man's success in the professional schools to what subjects he devoted himself mainly in college, but that it made an enormous difference how and with what power, ability and success he worked in college. The figures might

show either that a man was born with the qualities which would enable him to gain honors both in the college and in the professional schools, or that he who has worked hard in college has acquired a power he would not otherwise have, and therefore succeeds in the professional schools. Pedagogically the figures seem to mean for persons of mature age either that ability acquired in one branch of study as a method of thought and work is transferable to another to a very considerable extent, or that the general intellectual and moral attitude is far more important than the method."

Dr. Snedden, addressing the Department of School Administration on "The Need for Better School Reports and Publicity," said: "The published school report is a communication to the public. Its aim is to inform the public as to what has been done in the schools, and what should further be done by and for the schools. It is probable that the first appearance of school reports should be in the form of successive bulletins, each one dealing briefly and forcefully with some particular educational issue. The public has a right to have its questions regarding education answered; but it must be made a matter of common knowledge that there are types of questions which cannot be answered out of our available knowledge. In other words, statistics in education only affect certain regions; others are not reached at all. We have lately learned how to measure retardation, and we are striving to measure the causes of retardation. So far, however, few have suggested that we can measure the relative values of different studies in terms of the results they produce. This being so, it is difficult to answer the general question, 'How much does a given type of educational procedure pay?' For this purpose we need better units of measurement and standards of comparison."

After a rather stormy business meeting Mrs. Ella Flagg Young, Superintendent of Schools, Chicago, Ill., was elected president of the Association for the ensuing year. J. C. B.

NOTES ON THE SESSION OF THE PLAYGROUND CONGRESS. JUNE 7-11, 1910.

The session of the Playground Congress held in Rochester, June 7-11, was notable in several particulars.

One noted the evident expansion of the playground movement to a more vital relation with public recreation and amusement. The city's interest in the play life of its people must necessarily be concerned with

the theatre, the nickelodeon, the dance hall and public celebrations, not only as they are related to the young people, but also to the men and women workers of the community. The leisure time of a people is worthy of sane, thoughtful, wise guidance in all of its various avenues.

One also noted the possibilities of a closer relation of the public schools to the movement. Rochester, as a seat of the social-center movement in public school buildings naturally called attention to this feature. The general participation of the public schools in the musical and play festivals of the week added further suggestions along this line and brought to consciousness the tremendous possibilities and power of the public schools and public school teachers, if once they should bring their strength and opportunities to bear upon the play life of the community.

One noted also the tremendous popularity and rapid extension of the movement in general, the many and far cries from all over the country for guidance and help—with some concern, because of the sense of lack of ways and means to meet adequately the needs of all. But one noted also among many a spirit of comradeship, a tightening of belts, a drawing of breath, a setting of teeth, that promises a fight to the finish together for the Playground Association of America and its work in the world.

G. E. JOHNSON.

Pittsburg, Pa.

ABSTRACTS AND REVIEWS.

R. M. YERKES. *Modifiability of Behavior in its Relation to the Age and Sex of the Dancing Mouse.* Journal of Comparative Neurology and Psychology, 19; 1909, 237-271.

R. M. YERKES AND J. D. DODSON. *The Relation of Strength of Stimulus to Rapidity of Habit-Formation.* Journal of Comparative Neurology and Psychology, 18: 1908, 459-482.

The value to comparative and educational psychology of systematic and exact studies of methods of learning and of the effect of experience in modifying behavior cannot be doubted. Such a study of the dancing mouse is reported in the two papers cited above. They are a continuation of similar studies described in the author's book on the dancing mouse.[1]

The experiments fall into five main groups: (I) The relation of age and sex to rapidity of acquisition of a visual discrimination habit. (II) Sensitiveness to electric stimulus in its relation to age and sex. (III) Strength of electric stimulus in its relation to rapidity of habit-formation. This subject is treated in detail in the second paper. (IV) Relation of difficultness of discrimination to rapidity of habit-formation at different ages. (V) Relation of age to rapidity of acquisition of labyrinth habits.

The method used in groups I-IV is essentially the same. The habit to be formed is that of discriminating between two passageways or boxes, one of which was marked by a black cardboard, the other by a white, and of choosing the white one. A wrong choice was punished by means of an electric shock from wires on the floor of the boxes. In group II the strength of the electric current could be regulated and varied and in group III it was measured accurately.

In the first series of experiments, those on the relation of age and sex to rapidity of acquisition of the habit, ten mice were used, five males and five females, for each of the ages of one month, four, seven and ten months. The results of the experiments which are presented

[1] R. M. YERKES. *The Dancing Mouse: a Study in Animal Behavior.* New York: The Macmillan Company, 1907, xxi, 290.

in a number of tables and charts may be summarized as follows: (1) The dancers of both sexes at one month of age acquire a particular white-black visual discrimination habit more rapidly than do other individuals. From this time until the seventh month there is steady decrease in rapidity; from the seventh to the tenth month the reverse is true. (2) Young males acquire the habit more quickly than young females, but later the females acquire the habit more quickly. (3) Curves of learning for the sexes indicate that the female makes more mistakes early in the training tests than does the male, but this soon gives place to greater accuracy of choice on the part of the female.

In the experiments of group II ten pairs of mice were tested as to the threshold value of the stimulus for the individual, with the following results: (1) the males appear to be somewhat more sensitive than the females; (2) there is no indication of change of sensitiveness with increase in age; (3) individual differences in sensitiveness are more marked than sex or possible age differences.

The experiments of group III form a thorough quantitative study. Three sets of experiments were tried: In Set I the amount by which the two passages or electric boxes differed in brightness was medium and the ease of discrimination was medium; in Set II the difference in brightness was great and the discrimination was, therefore, easy; in Set III the difference was slight and discrimination difficult. Three degrees of strength of stimulus were used in Set I, five in Set II, and four in Set III. The exact values are given in figures, but they are designated in general as weak, medium and strong.

From the results obtained in this work the authors have formulated a law of habit-formation: "As difficultness of visual discrimination increases that strength of electrical stimulus which is most favorable to habit-formation approaches the threshold. The easier the habit the stronger that stimulus which most quickly forces its acquisition; the more difficult the habit the weaker the stimulus which most quickly forces its acquisition."

In group IV the experiments of group I were repeated under somewhat different conditions. The results appear to be contradictory and emphasize the importance of the conditions of visual discrimination. They go to show that under the conditions of easy discrimination the old mice learn more quickly than the young ones; that, however, the young mice possess better discriminating ability or acquire that ability more rapidly. In other words, the educability of white-light vision of

the young mice is greater than that of the old ones, but, on the other hand, associative memory is more prominent in the old mice.

In order to test further this latter result young and old mice of both sexes were trained in two labyrinths, at first in labyrinth D and one month later the same individuals in labyrinth C. Comparing the young with the old males it was found that the latter acquired the habit in both labyrinths more quickly than the former. In the two groups of females, however, there was practically no difference. The evidence, therefore, seems to favor the conclusion that associative memory in the dancer improves during the first year of life.

A number of these experiments are to be repeated with other animals, but it seems allowable to draw certain general conclusions from this work with the dancing mouse, which may be of importance in both comparative and human psychology.

(1) In the earlier experiments it was noted that the females at the beginning of the series made more mistakes of choice than the males, but they very soon began to choose with greater accuracy and ultimately acquired a perfect habit sooner than the males. The number of errors at first apparently gave the animals that experience which enabled them to adjust themselves more rapidly and to learn therefore more quickly.

(2) The strength of the electric stimulus which is used as an incentive for habit-formation is extremely important as a determinant of rate of habit-formation. For a given animal and condition of visual discrimination there is a certain strength of stimulus which is most favorable for the acquisition of the habit (optimal stimulus). It is very necessary before undertaking to study the intelligence of a particular animal that the experimenter determine the value for it of the several factors which constitute the chief conditions of activity. That a number of laws of habit-formation may thereby be discovered cannot be doubted.

(3) The acquisition of the visual discrimination habit apparently depends in the dancing mouse upon two important and to a certain extent independently variable conditions: (a) ability to sense the difference in illumination of the two boxes or to gain that ability (educability of white-light vision); (b) ability to associate the darker box with the electric shock (associative memory). If this should hold true of other animals it is evidently important that the senses be trained early in life and that associative memory be especially developed later.

Cambridge, Mass. ADA W. YERKES.

HELEN THOMPSON WOOLEY. *The Development of Right Handedness in a Normal Infant.* Psychological Review, 17: January, 1910, 37-41.

Mrs. Woolley has repeated, in substance, the experiments of Baldwin upon the use of right or left hand in infants in reaching for colors or other attractive objects. Her results confirm Baldwin's conclusion that 'reaching,' *i. e.,* picking up an object so situated as to require some effort to secure it, calls out the use of the right hand almost exclusively, and this even at the close of the 7th month (Baldwin's observations were made in the 9th month), when general observation under non-experimental conditions shows no signs of preference for either hand.

In another instance the child had come, through the circumstance of being held always in such a way as to leave her left hand free at the time, to use her left hand only in waving 'bye-bye.' At 15 months, this habit had been completely broken up and a persistent right-hand habit had been substituted for it.

In her ordinary activities right-handedness had become evident to casual observation by the end of the 9th month.

Mrs. Woolley concludes that "right-handedness must be a normal part of physiological development, not a phenomenon explicable by training."

CORNELIUS HOOD.

C. H. JUDD. *On Scientific Study of High-School Problems.* School Review, 18:2, Feb., 1910. Pp. 84-98.

In this paper Professor Judd presents a strong plea for the application of scientific method to the study of the pressing problems of secondary education. Such study does not necessarily involve elaborate apparatus or unusual conditions. On the contrary Professor Judd maintains that even the ordinary examination may form a fruitful source of data. A study of different sets of papers written in answer to the same questions will reveal differences in the type of instruction, in the ability of pupils at different ages and in the emphasis that different teachers have placed upon the various phases of the subject. Another source of data is to be found in the records that are kept for administrative purposes. A system of marking may be much more equitably applied, for example, if every teacher knows the average mark of the pupils in the school, and the highest and lowest marks. A third and very important source of data is readily accessible in the variations that are being introduced in the organization of secondary science. The

need here is to keep an accurate record of the results obtained under different types of organization. "We lose more pedagogical experience every year than would be required, if put in permanent form, to make the most valuable book on education ever written."

W. C. B.

J. DEWEY. *Science as Subject-Matter and as Method.* Science, 31: 787, January 28, 1910. 121-127.

This paper embodies the address which Professor Dewey delivered as chairman of Section L, A. A. A. S., at the recent Boston meeting. His fundamental thesis is that science has not justified its early promises as a part of the educational curriculum. Among the causes that have contributed to this partial failure of science in the schools, the most important, Dewey believes, is the point of view from which the sciences have been taught. He maintains that the informational or subject-matter value has been uppermost in the minds of both teachers and pupils, to the neglect of the method-value. The aim of science teaching should constantly be to give the pupil the scientific attitude and habit of mind. This can be accomplished only by leading the pupil to "take a hand in the making of knowledge, by transferring guess and opinion into belief authorized by inquiry."

If the science of the secondary school is not now taught with this value in mind, it is not because the value has remained unnoticed and unemphasized by those who are regarded as authorities in the field; and, indeed, both the organization of secondary courses and the spirit of instruction seem distinctly to represent an attempt to realize just this disciplinary value. The Report of the Committee of Ten which has had so marked an influence upon secondary education certainly did not emphasize the informational side of secondary science as contrasted with the method-side. There are those who maintain that it is this disciplinary attitude that has caused the relative falling off in science-registrations during the past ten years, and that the only hope of secondary science is to drop the vestments of pure science and assume the economic garb. There is a possibility that this course might do rather more even to realize the disciplinary values as Dewey conceives them than the present organization of the sciences is now accomplishing in the secondary school.

W. C. B.

WALTER D. SCOTT. *Personal Differences in Suggestibility.* Psychological Review, 17: March, 1910, 147-154.

Scott's object was "to determine to what extent suggestion is a general faculty and therefore to what extent individuals could be ranked as to the degree of their suggestibility." His method was to subject the same group of college students to two tests of suggestibility and to correlate their scores in the tests by the Pearson formula of correlation.

The first method was based upon the observation of the flight of after-images following exposure for 20 sec. to white light. The normal sequence of colors is said to be blue, green, red, blue and the red stage is said not to begin normally until more than 20 sec. after the first appearance of color. The experimenter, by exhibiting before the test mounted spectral charts, prisms, color-discs of the spectral colors and by certain verbal statements, sought to convey to the observers the notion that the flight of colors would follow the order of the spectrum, and after each exposure, sought to augment this suggestion by asking such questions as: "Is it red yet? Now is it red, etc.?"

The second method consisted in sending a 110-volt, direct current through a bank of lamps and through a coil of naked German silver wire, with the relation ot current and wire so adjusted that the observer, when holding the coil of wire between his fingers, felt an appreciable rise in temperature in from 5 to 10 sec.

A concealed switch enabled the experimenter, at will, to admit the current to the resistance coil or to shunt it off entirely, without disturbing the illumination from the lamps. Twenty trials were given: in the first ten the coil was really heated, in the second ten the coil was not heated, unless at the expiration of a certain time the observer had failed to report warmth.

The correlation of suggestibility in these two tests proved to be insignificant. The question arises: does this indicate that there is no such thing as general suggestibility, that it is impossible to speak of an observer as being highly suggestible or to rate him in suggestibility at all; must we speak merely of suggestibility to warmth-illusion, suggestibility in observing after-images, etc., or were the conditions in the two tests so dissimilar that the coefficient of correlation was reduced on that account? Scott points out several differences in the conditions of experimentation that might have reduced the correlation, and suggests several modifications in the first method that might have made it more similar, psychologically, to the second.

It seems to the reviewer that the second test might have been modified very simply by giving all of the heat-tests without objective warming of the coil. This variation in method should be tried before it is finally concluded that the suggestibility of an observer varies from test to test, without being affected by any general mental disposition such as most writers have in mind when they speak of an individual's suggestibility.

A more serious criticism may be directed against the flight of color test. Suggestibility is assumed to be demonstrated, as we have noted, by departure from the "normal sequence," blue, green, red, blue,—a sequence apparently taken from Helmholtz. Now the flight of colors after exposure to white light has by no means a normal sequence. In the second, or negative stage, the sequence red, blue, green, is, to be sure, very constant and obtained by most observers under somewhat varied conditions; but the first or positive stage is essentially variable; what is seen depends (*a*) upon individual differences in the functioning of the retina, (*b*) upon the amount of practice the observer has had, (*c*) upon the degree of adaptation secured before the exposure, (*d*) upon the extent, intensity and duration of stimulus. Scott gives us no exact statement of the degree of adaptation, and it is fair to assume that the intensity of the stimulus varied with the condition of the sky. If adaptation lasted five minutes, the positive image would often show patches of red or of green within the first 10 seconds, and if the illumination were much diminished, the first image would be reddish white. It follows that the report of red within 20 sec. is not, as Scott assumes, a clear demonstration of suggestibility. If this criticism be correct, the whole argument against the existence of general suggestibility, so far as Scott's work goes, falls to the ground.

C J. Rogers.

Boris Sidis. *An Experimental Study of Sleep.* Boston: Richard G. Badger, 1909. Pp. 106.

Dr. Sidis has made a significant contribution to the study of sleep through a series of laboratory experiments on frogs, guinea pigs, cats, dogs, and infants. He finds that the condition of sleep is similar to the condition produced by suggestion, both normal and abnormal. In these experiments he followed somewhat the same method as in experiments upon suggestion—monotony of stimulation and limitation and restriction of voluntary movements—and produced similar results. Before

passing into the sleep state the subjects experimented upon passed through the hypnoidal or subwaking state. The same was noticed upon passing out of the sleep state. This intermediate state is brief and very unstable and oscillates between the waking state and sleep or hypnosis.

In part II the author formulates his theory of sleep in terms of cell energy and stimulus exhaustion. Living tissue responds to an external stimulus with some discharge of energy. The ability to respond has a certain limit. If the intensity of the stimulus remains the same, the result of stimulation becomes constantly less, and the stimulus finally fails to incite a response: the monotony of stimulation raises the threshold. What has been said of the cell applies also to the organism in general: the organism is asleep to a certain environment, when it fails to respond to it. Yet the same organism may be awake to stimuli which have as yet not exhausted themselves. This condition throws considerable light upon dream-life stinctive. It has developed out of the hypnoidal state. "Sleep is an and subconscious activities in general. He concludes that sleep is inactively induced passive state in relation to the external environment.

PAUL KNUTH.

University of Iowa.

T. H. MORGAN: *Chance or Purpose in the Origin and Evolution of Adaptation.* Science, 33: 789, Feb. 11, 1910. Pp. 201-210.

Professor Morgan is dissatisfied with the theory that adaptation is to be explained on the assumption that variations "chance" to find an environment suited to them. He feels that there must be some closer bond that "insures the continuance in a given direction of variations once begun," and he believes that the true explanation is to be sought in the assumed tendency of the germinal material, once it shows itself susceptible of change in an environment, to vary further in the same direction in that environment. In other words, the first accidental adaptation "loads the dice" for further favorable variations. "Each step that the organism has taken guarantees further responses in the same direction * * * The mechanism of survival * * * is such that it insures success where it is most called for."

W. C. B.

C. WARD CRAMPTON. *Education by Play.* Educational Review, 38: 5, December, 1909, 488-492.

Dr. Crampton maintains that play provides the most effective means of developing the virtues that are essential to the social life; and yet, in spite of the efforts that have been made to give the factor of play just recognition in the educational system, we are "threatened with, and have now, a relatively playless, and therefore godless, generation growing up without having virtually learned in any real way justice, courage, and the value of decently and fairly 'fighting hard and square' in the game of life."

Broad and sweeping statements of this sort are very common today in the educational periodicals. We recall having read similar dismal prophecies, urged in justification of almost every reform that has been proposed in education during recent years. We have no quarrel with educational reform in general and we have a very strong sympathy with the playground movement in particular; but men and women who are engaged in educational work and who are putting forth every effort to solve a multitude of most perplexing problems, are becoming impatient of the querulous and fault-finding tone that characterizes so much of our educational literature today. Let us by all means have plenty of playgrounds amply equipped and efficiently supervised, but is it necessary to the attainment of this commendable end that the attention of teachers be constantly directed toward the shortcomings of their present efforts? Is this really the most effective method of insuring efficient service? If it is, let us follow it by all means; but would that some reformer could adopt a more cheerful attitude, just for the sake of the experiment.

W. C. B.

AMERICAN INSTITUTE OF CRIMINAL LAW AND CRIMINOLOGY. *Report of Committe A. A System for Recording Data Concerning Criminals.* (Chicago; Northwestern University Law Publishing Association Press, December, 1909, Bulletin No. 2, Pp. 16.)

This pamphlet outlines a plan for recording systematically data secured in the investigation of individual criminals. It presents a scheme devised principally by Dr. William Healy, of Chicago, founder of the Juvenile Psychopathic Institute, in conjunction with a board of eight experts in sociology, medicine, psychology, anthropology and related disciplines, and in consultation with numerous experts. The plan has been

successfully used for the last eight months by Dr. Healy, has been recommended for adoption by the judges of the Municipal Court of Chicago, and is now offered for consideration by other workers, who are asked to communicate with Dr. Healy concerning their experiences with such methods of investigation.

The system embraces eight main divisions: (1) family history, (2) developmental history, including antenatal conditions, (3) environment, (4) character, (5) anthropometry, including photography, (6) medical examination, particularly from a neurological and psychiatric standpoint, (7) psychological examination, and (8) psycho-analysis, especially the offender's own narrative.

G. M. W.

G. L. DUPRAT. *La Criminalité dans L'Adolescence.* Paris: Felix Alcan, 1909, Pp. 254. 6 fr.

Discussing causes and remedies the author shows that juvenile crime is on the increase. Both the individual and society are contributing factors; the individual in his desire for license and society in furnishing stimuli for unwholesome reactions. Among the causes of criminality considered are morbid heredity often due to alcholism, poison or disease; family and social neglect, whereby school education is defective and public opinion contributes little to restraint; immoral education issuing through culpable parents, debauchery and the influence of organized bandits; economic conditions indirectly through the results of the inequalities in industrial and commercial life; and social disintegration through suicide, increase of crime, anarchy and demagogic tendencies. Among the remedies proposed, he emphasizes the need of correction and repression, though criticizing the methods of the penal institutions. He argues for public vigilance in the detection of crime and private enterprise in putting it down. He would provide for such children as are morally abandoned, mistreated and improperly cared for, even over the so-called rights of their parents. He would compel school attendance, provide special education for abnormal children and would provide for all children a means of will training in some serious activity. He would seek to make reforms in public opinion, in the press and in the theatre; and he would set up definite movements against debauchery and prostitution, against family separations and social dissolution.

ROLLAND M. STEWART.

University of Iowa.

GUSTAV MAJOR. *Zur Erkennung jugendlichen Schwachsinns.* Zeitschrift für Experimentelle Pädagogik, 9: 1909, 1-73.

The author maintains that weak-minded children are capable of being taught if the proper methods are employed. But the public school has for its purpose the training of normal children and cannot take care of the feeble-minded. These must be removed to proper institutions. The hope of improvement diminishes with the advance of years. Physically, feeble-mindedness represents arrested development of the entire organism.

The feeble-minded are grouped into three classes, debility. imbecility and idiocy, corresponding to light, medium and severe cases. The leading characteristic of the first class is their ethical defect, that of the last two intellectual defect. A clear distinction is made between mental weakness and mental disease, and likewise between the ethical defect of the feeble-minded and that of normal children. In the case of the feeble-minded, punishment is of little avail for the moral sentiment is impaired. He closes his discussion with an enumeration of the causes of mental weakness, which is valuable for the moral it contains. The author's method for the detection of mental debility is fairly simple and can be applied by the capable parent and teacher.

The author gives a full outline of procedure in diagnosis, the chief tests being (1) mathematical problems; (2) questions involving discrimination; (3) tests of school learning, and (4) various tests by the psychoanalytic method such as association reactions, tests of mental imagery and analysis of stories. He also adds an elaborate outline for medical examination.

PAUL WILHELM KNUTH.

University of Iowa.

NOTES AND NEWS.

The Association for School Reform has been organized in Germany through the co-operation of the leading educational psychologists of the country. The work is necessarily in the nature of criticism at first, but a very promising constructive program has been announced and it has already been proposed to change the name to "Bund für Erziehung und Schule." (It is most remarkable that we do not have in English any equivalent for the natural meaning of the word "Erziehung;" there is a wide gap between "to raise" and "to educate" which is not adequately filled by "to rear," but it is this unnamed conception which is coming to the front in educational reforms of the day.) The immediate aim of the association is two-fold: the adjustment of the school life, and the development of the child as a whole, mind and body in their various capacities. To this end a strong association has been formed for conferences, encouragement of research, collection and systematization of facts bearing on these issues and for the arousal of public opinion.

A deputation from University College, Reading, England, visited selected institutions in the United States and Canada during May and June. The deputation, which consisted of Mr. Leonard Sutton, Mr. E. D. Mansfield, Principal W. M. Childs and Professor Frederick Keeble, all of the Council of University College, and Mr. R. V. O. Hart-Synnot, Director of the Department of Agriculture and Horticulture of the same institution, was collecting information and will present a report with special reference to the development of professional instruction in agriculture and in education on this side of the water.

Meumann's Zeitschrift für Experimentelle Pädagogik, 9: Pp. 241-270, contains an interesting account by the director, Dr. M. C. Schuyten, of his first ten years of work in his now famous Paidological Laboratory at Antwerp. The laboratory was established by the city and the director is given a free hand for practical work in the schools, for study of special cases in the laboratory, and for scientific research according to his own inclinations. The laboratory is equipped with

such psychological and pedagogical apparatus as may be needed, and receives the leading technical journals and books bearing more or less on educational psychology. The situation is unique in the fact that Dr. Schuyten is a chemist and his research centers upon the study of chemical reactions for the purpose of finding out the nature of the fatigue process of the brain. The director, however, reviews current literature and not only aids teachers through conference, but publishes extensively. His bibliography during the past ten years contains fifty-nine titles.

The first meeting of scientists interested in the psycho-analytic method of Freud was held at Salzburg in 1908. A second gathering was held at Nuremberg, March 30-31 of this year, and was attended by some 60 adherents of the Freudian school. Nearly a dozen papers were presented; an international organization was arranged with a central office at Zurich under the presidency of Jung; an international committee was appointed and a monthly bulletin launched to keep members of the association in touch with the development of this interesting movement. In so far as the plans of the organizers of the psycho-analytic method look toward the contribution of new facts and principles bearing upon general psychology as well as upon psychopathology, it is quite possible that our knowledge of mental development in the normal child may be enlarged in a definite and helpful manner by the labors of Freud and his followers.

At the spring meeting of the General Education Board, $682,450 was voted. Of this sum, $31,450 was apportioned for the salaries and expenses of special professors of secondary education in the State universities of the South.

"A laboratory for the study of criminals and defectives, according to the general plan advocated by Arthur MacDonald, of Washington, has recently been established in Russia with a relation to the Russian Govern- to the Government of the United States. Seven hundred and fifty thousand dollars have been appropriated by the Government for the establishment and maintenance of the laboratory. It will be remembered that several years ago Mr. MacDonald proposed the establishment of such a laboratory by the United States Government, the same to be under the jurisdiction of the Department of Justice. A vigorous propaganda in favor of the project was conducted by him, and it received the approval of many scientists and lawyers, but failed of passage. More recently he submitted his scheme to various European governments and its adoption

by the Russian Government is, we believe, the first fruits of his long and persistent efforts in the interest of the scientific study of the criminal classes."—*Journal of Criminal Law and Criminology.*

In *L'Education* for June, 1910, Dr. Henri Schoen gives an account of the recent movement for the teaching of sex hygiene in the German gymnasia. The instruction is given at the end of the course, immediately before the pupils leave the restricted environment of the gymnasium for the greater freedom of the university or of the business world. According to the testimony of teachers in English and American secondary schools it would seem that the information thus gained comes rather too late in the pupil's life to be of the greatest benefit.

The Boston *Record* reports the following: "The new method of medical inspection for schools that the board of health has recently urged upon Mayor Fitzgerald for approval, has not been received by the Mayor with any degree of enthusiasm. The scheme is to get rid of half the 80 physicians who are now receiving $300 yearly for practically nothing, and have in their places 40 men to draw $1,000 each. Immediately following the receipt by the Mayor of the new plan of the health officials, scores of physicians who want the new berths began to visit the Mayor's office. Because of the abundance of wire-pulling by the physicians anxious to get among the '40' and the consequent trouble for the Mayor, he has practically decided to maintain the old system for the present." Such a state of things furnishes another argument in support of Superintendent Maxwell's contention that the medical inspection of schools should be under the control of the board of education.

We are glad to call the attention of our readers to Professor Münsterberg's communication regarding *Basedow's Elementarwerk,* which will be found in another column. Professor Münsterberg writes: "I am so delighted with the book that I should like to spread the interest in it." We hope to give a more detailed review of the work in a later number.

The Berlin Psychological Association is engaged in an interesting and important study of the psychology of the motor individual. An elaborate questionnaire has been worked out, containing 31 questions on the basis of three simple experiments, and the Association desires to secure the detailed introspection of as large a number of adults as possible. The questions are designed to furnish information regarding (1) the motor

element in internal speech, (2) irradiation movements resulting from concentrated attention, such as "thinking aloud," marking the rhythm of music with a slight expulsion of the breath, beating time, following and "controlling" the course of a billiard ball after it is struck, etc., (3) general activity and tendencies to movement (4) expressive movements accompanying musical thought (5) motor accompaniments of the act of thinking the musical scale. Copies of the questionnaire may be obtained of Dr. Richard Baerwald, Halensee-bei-Berlin, Bornimerstr. 17.

In the *Zeitschrift für Psychotherapie und medizinsche Psychologie,* Vol. 2, No. 1, Dr. L. Loewenfeld reports a number of cases of surprising recall of childhood memories under hypnosis, memories which for normal consciousness had entirely lapsed. The recall is not immediate, but requires a certain amount of time and effort, and the details develop gradually, growing one out of the other just as in normal memory. Sometimes the action is so much delayed that recall is post-hypnotic rather than under hypnosis. The lighter stages of hypnosis gave the best results. The events recalled go back in some cases as far as the third year of the subject's life. This opens an interesting field for speculation as to the neural activities involved, and raises the question whether in education the parent or teacher may not profitably make use of a kind of hypnoidal suggestion in reviving previous experiences.

Gradually the German universities are waking up to the value of the scientific study of education. We note in the press that Tübingen is to have a professor of pedagogy.

A writer in *L'Education* complains that of all the higher institutions of learning in French-speaking countries only seven give instruction in educational psychology. These are the Musée Pédagogique and the Hautes Etudes in Paris, and the universities of Bordéaux, Lille, Lyon, Genève and Neuchatel. "Why have not all the faculties their courses in experimental pedagogy? The field is vast enough, and the interest in education is strong enough for all the learned psychologists of our universities to try to contribute something to the progress of this science and for the public to concern itself with it for other than political reasons."

The *Journal of the American Medical Association* states that the University of Pittsburgh will establish in connection with its medical department a laboratory and school for the study of backward children. The scope of the work will include psychologic studies of mental defectives

and delinquents, both children and adults, epileptics and the nervous unfit of all kinds. It will also include work in the university laboratories and the training of nurses and prospective teachers in work of this kind. The work will be under the direction of Professor J. H. White, of the department of psychology, Dr. Edward E. Mayer, of the department of neurology, and Dr. E. Bosworth McCready will be the medical director. The school is to be called the Hospital School for Backward Children.—*Science.*

Here is the *Journal of Education* (London) protesting against too much teaching in the schools. It is all the fault of the Inspector. "The advent of the Inspector in secondary schools, and his advice to the head master to go around the classrooms and see what the masters are doing and how they teach, have resulted in a wide if partially subconscious feeling that one must always be teaching, always giving direct instruction. * * * We need fewer lectures, less direct instruction, and more quiet and thoughtful work on the part of the pupils." What would our German friends think of this?

By a vote of 11 to 10 the congress consisting of twelve undergraduates, twelve alumnæ, four faculty members and President Hazard, which was selected to decide the future of the six secret societies of Wellesley College, decided that the societies should be opened to any eligible student on application, without any voting on the part of the societies. It was voted that opportunity for membership in the societies should be limited to three classes of diploma grade students, these grades to consist of those of high academic standing, those showing unusual excellence in any department and those who have given evidence of public spirited service in aid of the college. The latter qualification is to be determined by a committee or organization other than the societies alone. Each society will continue to occupy its own fraternity house.—*The American College.*

The sixth annual meeting of the Southern Society for Philosophy and Psychology will be held at Chattanooga, Tenn., December 27-29, 1910, in conjunction with the meetings of the Southern Educational Association.

According to *Nature* a joint meeting of the Aristotelian Society, the British Psychological Society and the Mind Association, was held in London, June 24 and 25, at which, among other discussions, a symposium on "Instinct and Intelligence" was presented, consisting of papers by Messrs. C. S. Myers, C. Lloyd Morgan, H. Wildon Carr, G. F. Stout and

Wm. McDougall. A paper was also read by Mr. W. H. Winch on "The 'Faculty' Doctrine; an Outline of some Experiments on Children in Relation to this Doctrine."

At a meeting of abnormal psychologists held in Washington, D. C., May 2, 1910, the formal organization was perfected of the American Psychopathological Association. Dr. Morton Prince was elected president for the ensuing year and Dr. G. A. Waterman, secretary and treasurer. The proceedings will be published in the Journal of Abnormal Psychology, which was constituted the official organ of the association.

We regret to note the death, at Chocorua, N. H., August 26, 1910, of Dr. William James, emeritus professor of philosophy at Harvard University, for many years director of the work in psychology in that institution. Professor James was generally acknowledged to be the leading American psychologist, and his writings have made his name well known both in this country and in Europe. His influence on the educational thought of the country has been without parallel, and while not closely identified with the modern movement in educational psychology, he has probably done more to familiarize teachers with the fundamental conceptions of psychology than any other man of his generation.

Mr. Edward C. Hegeler, founder of *The Open Court* and president of The Open Court Publishing Company, died at La Salle, Ill., June 4, 1910.

Professor G. F. Arps, of Indiana University, has been appointed assistant professor of psychology in the University of Illinois, taking the place made vacant by the resignation of Dr. J. W. Baird.

Mr. T. L. Kelley, instructor in mathematics at the Georgia School of Technology, has been appointed assistant in psychology in the University of Illinois.

Mr. C. M. McConn, principal of the Academy of the University of Illinois, and supervisor of practice-teaching in the School of Education, has been appointed Registrar of the university, vice W. L. Pillsbury, resigned.

At the University of Missouri Professor W. W. Charters has been made dean of the faculty of the School of Education, Drs. J. H. Coursault and J. D. Elliff have been advanced from assistant professorships to professorships of the history and philosophy of education and of school administration, respectively, and Carter Alexander, fellow in Teachers'

College, Columbia University, has been made assistant professor of educational administration.

Dr. E. P. Frost, instructor in philosophy at Princeton University, has been appointed instructor in psychology at Yale University, to take the place of Dr. Frederic S. Breed, who has been called to the University of Michigan as assistant professor of education.

Professor W. T. Foster has vacated the chair of education at Bodoin College to assume the presidency of the Reed Institute at Portland, Oregon.

Dr. J. E. Wallace Wallin, head of the department of psychology and education, Cleveland Normal Training School, has been appointed director of the laboratory of clinical psychology at the New Jersey State Village for Epileptics, Skillman, N. J. Dr. Wallin has also been designated director of psychological research by the committee on oral hygiene of the National Dental Association. A squad of children suffering from decided oral defects has been segregated for special treatment during half a year or more. A number of standard psychological tests will be carried out at stated intervals, in order to obtain an objective and demonstrable measure of any mental improvements which may result from the restoration of normal oral conditions.

Dr. Bird T. Baldwin has been released from a professorship of school administration at the University of Pittsburg in order to accept a call to the University of Texas, where he will be head of the School of the Science and Practice of Teaching and associate professor of education. His courses will include work in educational psychology and experimental education.

Mr. Milo B. Hillegas, assistant in education, Teachers' College, Columbia University, has been appointed editor of the Bureau of Education, Washington, D. C. He will have charge of all the publications of the bureau.

Dr. C. J. C. Bennett (Ph. D., Columbia), president of the State Normal School, Fairmont, W. Va., has been appointed professor of psychology in the University of Oregon, Eugene, Oregon.

Dr. Stuart H. Rowe, head of the department of psychology and education, Brooklyn Training School for Teachers, has accepted the appointment of principal of the Wadleigh High School, New York City.

PUBLICATIONS RECEIVED TO AUGUST 1, 1910.

EMMET DUNN ANGELL. *Play: Comprising Games for the Kindergarten, Playground, Schoolroom and College.* Boston: Little, Brown and Company, 1910. Pp. 190. $1.50.

FELIX ARNOLD. *School and Class Management. Vol. II. Administration and Hygiene.* New York: The Macmillan Company, 1910. Pp. xii, 288. $1.00 net.

W. VAN DYKE BINGHAM. *Studies in Melody.* Psychological Monographs, 12: No. 3, January, 1910. Pp. 88.

GUSTAF BJORKLUND. *Death and Resurrection.* Chicago: The Open Court Publishing Company, 1910. Pp. 205. $1.00.

MARY WHITON CALKINS. *A First Book in Psychology.* New York: The Macmillan Company, 1910. Pp. xvi, 419. $1.90 net

JULES COMBARIEU. *Music: Its Laws and Evolution.* New York: D. Appleton and Company, 1910. Pp. 334, $1.75 net.

JOHN DEWEY. *The Influence of Darwin on Philosophy.* New York: Henry Holt and Company, 1910. Pp. 309.

JUNE E. DOWNEY. *Preliminary Study of Family Resemblance in Handwriting.* University of Wyoming, Department of Psychology, Bulletin No. 1. 1910. Pp. 51.

LYDA B. EARHART. *Teaching Children to Study.* Boston: Houghton Mifflin Company, 1909. Pp. 182. 60c. net.

FREDERIC ERNEST FARRINGTON, PH.D. *French Secondary Schools.* New York: Longmans, Green and Company, 1910. Pp. ix, 450.

THEODOR FRITZSCH, Herausgeber. *J. B. Basedow's Elementarwerk, mit den Kupfertafeln Chodowiecki's u. a.* 3 Bände. Leipzig: Ernst Wiegandt Verlagsbuchhandlung, 1909. Imported by G. E. Stechert & Co., New York. Bd. 1, S. 543; Bd. 2, S. 576; Bd. 3, S. 35 und 96 Kupfertafeln. Halbpergament, Mark 28.

KATE GORDON. *Aesthetics.* New York: Henry Holt and Company, 1909. Pp. 314.

EDWARD C. HEGELER. (Memorial pamphlet.) Chicago: The Open Court Publishing Company, 1910. Pp. ii, 4.

LOGAN DOUGLASS HOWELL. *The Howell Primer.* New York: Hinds, Noble and Eldridge, 1910. Pp. 127. 25c.

G. E. JOHNSON. *What to Do at Recess.* Boston: Ginn and Company, 1910. Pp. vii, 33.

AMY KAHN. *Barnes' First Year Book.* New York: The A. S. Barnes Company, 1910. Pp. 138.

I. L. KANDEL. *The Training of Elementary School Teachers in Germany.* New York: Teachers' College, Columbia University, 1910. Paper $1.15. Cloth $1.50.

F. MEAKIN. *Function, Feeling and Conduct.* New York: G. P. Putnam's Sons, 1910. Pp. xviii, 276. $1.50 net.

ANNE M. NICHOLSON. *The Concept Standard.* New York: Teachers' College, Columbia University, 1910. Pp. 138. Paper $1.15. Cloth $1.50.

W. B. PILLSBURY. *The Psychology of Reasoning.* New York: D. Appleton and Company, 1910. Pp. 306. $1.50 net.

Psychotherapeutics: A Symposium by MORTON PRINCE *and eight others.* Boston: The Gorham Press, Richard G. Badger, 1910. Pp. 204. $1.50 net.

FLORENCE RICHARDSON. *A Study of Sensory Control in the Rat.* Psychological Monographs, 12: No. 1, October, 1909. Pp. 124. $1.25.

SANTE DE SANCTIS. *Infantilismo e mentalità infantile.* Reprinted from Ravista Italiana di Neuropatologia, Psichiatria ed Elettroterapia, Vol. III, No. 2.

SANTE DE SANCTIS E LANFRANCO CIAMPI. *Rendiconto delle malattie trattate nella casa di cura e di educatione per fanciulli nervosi.* Orvieto: Marsilio Marsili, 1909. Pp. 67.

PETER SANDIFORD. *The Training of Teachers in England and Wales.* New York: Teachers' College, Columbia University, 1910. Pp. 168. Paper $1.15. Cloth $1.50.

ARLEY BARTHLOW SHOW. *The Movement for Reform in the Teaching of Religion in the Public Schools of Saxony.* Washington: Government Printing Office, 1910. Pp. 45.

ALVA WALKER STAMPER. *A History of the Teaching of Elementary Geometry.* New York: Teachers' College, Columbia University, 1909. Pp. 163. Paper $1.15. Cloth $1.50.

CLIFF WINFIELD STONE. *Arithmetical Abilities and Some Factors Determining Them.* New York: Teachers' College, Columbia University, 1908. Pp. 101.

JAMES P. WARBASSE. *The Conquest of Disease through Animal Experimentation.* New York: D. Appleton and Company, 1910. Pp. xiii, 176.

MARY S. WOOLMAN. *The Making of a Trade School.* Boston: Whitcomb and Barrows, 1910. Pp. iv, 101. 50c.

American Institute of Child Life (Correspondence): *Report of Committee on A Method for Recording Data Concerning Preschools* (C. M. W.) 423

G. L. Duprat: *La Personnalité dans l'Adolescence* (Rolland M. Stevens) 424

Gustav Mayer: *Zur Genese und Entwicklung Abnormer Affekte* (Paul Wagenhals Kauda) 425

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Manuscripts for publication, books or other material for review, and news items of interest to educational psychologists should be addressed to The Managing Editor, Dr. Carleton Bell, 1833 Sterling Place, Brooklyn, N. Y. Research contributions from England may be sent to W. H. Winch, Esq., Melville Villa, Churchill Road, Dulwich, London.

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